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Gleanings in Bee Culture



Let the March winds blow.

Volume L

March

Number 3

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Editorial Staff

Geo. S. Demuth and E. R. Root
Editors

A. I. Root
Editor Home Dept

H. H. Root
Assistant Editor

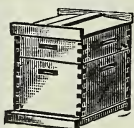
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1631 West Genesee Street
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HONEY MARKETS

U. S. GOVERNMENT MARKET REPORTS. Information from Producing Areas. (First half of February.)

CALIFORNIA POINTS—Prospects for next season's crop considered favorable, both as to volume and quality, if spring rains are normal. The prolonged cold spell earlier in the season caused a setback to bees in some sections with many colonies considerably depleted in numbers. Prices show little change over those prevailing two weeks ago. Since the heavy rains many beekeepers have disposed of their reserve supply of honey, and those still holding are increasingly inclined to sell. "Honey Week," authorized by proclamation of the Governor of California for Feb. 6-11 inclusive, may slightly have helped retailers to dispose of their surplus stock, but apparently has not as yet stimulated buying from the brokers. Quotations continue largely nominal. Recent carlot sales of light amber alfalfa are reported at 6½¢ per lb.; one of light amber sage at 7½¢, and one of white orange blossom and sage at 11½¢ per lb.

INTERMOUNTAIN REGION—Bees generally wintering fairly well, but in need of early flight if spring dwindling is not to be serious. The cold weather and long confinement will mean a somewhat larger loss than normal. Spring feeding will be necessary with many colonies, due to open weather in fall which depleted stores. Crop outlook good for coming season. Supplies in carlot quantities clearing up, and local demand can be counted on to absorb small-lot surplus. Rather active inquiry received from both eastern and western buyers. The uniform carlot price for 5-gal. cans of white sweet clover and alfalfa is 8½¢ per lb., with occasional sales at 9¢, and with less-than-carlots ranging 10-12¢. Several carlot sales of Arizona light amber honey reported at \$7.00 per case of 120 lbs. Comb honey of No. 1 grade white sweet clover and alfalfa generally selling \$4.00-4.15 per 24-section case, with occasional sales high as \$5.00. For beeswax 20¢ per lb. in cash or 22¢ in trade is being offered.

PACIFIC NORTHWEST—The continued cold period, with little suitable flight weather, has caused a considerable loss of bees. The prospects for the 1922 crop are reported normal. Supplies of extracted honey are generally light, altho occasional beekeepers report much honey still in their hands. Light-colored extracted honey in small lots of 5-gal. cans is being sold at 10-12½¢ per lb.

TEXAS POINTS—The bees are generally wintering with little loss, altho some beekeepers report dwindling as result of constant flying. Stores have been rapidly consumed. Brood-rearing commencing in south Texas. Prospects for the new honey crop continue doubtful due principally to lack of rain during fall and winter. Extracted honey in 5-gal. cans selling mostly at 8½-10¢ per lb., with chunk honey 4¢ per lb. higher. Beekeepers are receiving 22-24¢ per lb. for beeswax.

EAST AND NORTH CENTRAL STATES—Wintering prospects greatly improved by several days of weather suitable for bee flights. Clover fields in northern part of area generally well protected by snow, but outlook for honey flow less favorable in southern section where many fields are bare of snow. Demand has increased somewhat, and the movement of honey is better than that of last month. Bottlers are offering 9½-10½¢ per lb. for carlots of white clover in 60-lb. cans. Many small lot sales of this size container made at 11½-15¢ per lb. Carlots of amber honey are quoted at 6-8¢ per lb., with smaller lots at 9-10¢. White comb honey ranges \$4.80-5.50 per case. Sales direct to consumer show great increase over those of last year. Some beekeepers are bringing in western honey to fill their orders.

PLAINS AREA—The mild winter has been favorable to bees, but lack of snow has injured prospects for good nectar flow next season. Sales of extracted white clover reported at 12¢ per lb. in 60-lb. cans.

NORTHEASTERN STATES—Supplies in beekeepers' hands are practically exhausted as result of unusually good demand. The bees are wintering well in both cellars and outside stands.

The outlook for the new crop is generally good, as clover fields are well covered with snow. Bees have enjoyed occasional flight days. Sales of buckwheat in barrels at 7¢ per lb., and at 9-10¢ per lb. in 60-lb. cans reported. Few sales made of extracted white clover in 60-lb. cans. Large lots of 24-section cases of white clover comb honey have sold around \$5.00 per case, with small lot sales direct to retailers and consumers at \$5.75-6.50 per case.

CUBA—Cuban honey continues to be quoted at 4¢ per lb. f. o. b. Recent heavy shipments to Holland reported at 54¢ per gal., including cost and freight.

Telegr. Reports from Important Markets, Feb. 14.

BOSTON—No carlot arrivals reported since last report. Conditions practically unchanged with light demand and steady prices.

CHICAGO—Since last report 1 car Nevada, 1 car Wyoming, 1 car Arizona, 2,000 lbs. Wisconsin, 3,000 lbs. Minnesota, and 3,500 lbs. Ohio arrived. Demand and movement slow to fair, market about steady. Extracted: Sales to bottlers, bakers and candy manufacturers, Arizona and Wyoming, per lb., alfalfa white 10-11½¢, light amber 9½-10¢. Michigan, Minnesota and Wisconsin, white clover 11½-12½¢. California, white mixed mountain flowers 11-11½¢. Comb: Sales to retailers, Ohio, Michigan and Minnesotas, 24-section cases No. 1 \$5.00-5.50. Beeswax: Receipts moderate. Demand and movement moderate, market about steady. Sales to wholesale druggists, ship supply houses and laundry supply houses, California, Colorado and Arizona, best crude 30-32¢, poorer 27-29¢. Central American, best crude 24-26¢.

NEW YORK—Both domestic and foreign receipts limited. Demand moderate, market steady. Extracted: Spot sales to jobbers, wholesalers, confectioners, bakers and bottlers, domestic, per lb., California, light amber, alfalfa 7-8¢, light amber sage 9-9½¢, few 10¢, white sage 11-12¢ mostly 11½¢, white orange blossom 12-14¢, mostly 13-14¢. Intermountain Region, white sweet clover 10-11¢, few high as 12¢. New York, white clover 11-12¢, buckwheat 7-8¢. West Indian, South American, refined 65-70¢, few high as 75¢ per gal., poorer low as 60¢. Comb: New York, 24-section cases white clover No. 1, \$6.00-7.00 per case. Beeswax: Foreign receipts limited. Supplies limited. Demand moderate, market steady. Spot sales to wholesalers, manufacturers and drug trade, South American and West Indian crude light, best 22-25¢, dark 15-18¢. African, dark 16-17¢, poorer low as 14¢.

H. C. TAYLOR,
Chief of Bureau of Markets.

From Producers' Associations.

There has been no local market for honey during the past month. Northern buyers have been buying granulated honey for their market. Mesquite and cotton honeys preferred. Demand increasing. Producers closing out their stocks at 8 to 10 cents. Bees are not in the best shape. Cold and dry weather are unfavorable to both bees and honey plants. Much feeding is being done. Beekeepers, however, are optimistic and are buying supplies freely.

Texas Honey Producers' Association.
San Antonio, Tex. E. G. LeSturgeon.

White extracted honey has recently moved from intermountain points in carlots at 8½¢ f. o. b. loading point. As far as we can find out there is but little fancy white in carlots left now. Some very good white comb honey is still available in carlots; but no interest was shown by jobbers for this commodity during the past month, altho a number of the important markets are practically bare of comb honey.

The Colorado Honey Producers' Association.
Denver, Colo. F. Rauchfuss, Sec'y.

Our members have consistently held their price on extracted honey at 8½¢ per lb. f. o. b. Idaho in carlots. We have been refusing 7½¢, 7¾¢ and 8¢ for weeks, and are now selling carlots at our price of 8½¢. Inquiry slackened noticeably just prior to the holidays but is now somewhat above normal, communications having been re-

ceived from buyers who were not interested in honey the first part of December. Local producers have sold considerable extracted honey in 5 and 10 lb. pails to local markets and it is almost a certainty that our 1921 crop will be cleared up shortly. Idaho-Oregon Honey Producers' Ass'n.
Caldwell, Ida. P. S. Farrell, Secy.

The A. I. Root Company's Quotation.
We are in the market for two carlots of white-

The Opinions of Honey Producers Themselves as Reported to Gleanings in Bee Culture.

Early in February we sent to actual honey producers and some associations the following questions:

1. What portion of the 1921 crop, if any, is still in the hands of the producer in your locality? Give answer in per cent.
2. What price are producers receiving for honey at their station when sold to large buyers? (a) Comb honey? (b) Extracted honey?
3. What are prices to retailers in small lots? (a) Comb honey, fancy or No. 1, per case? (b) Extracted honey in five-pound pails or other retail packages?
4. How is honey now moving on the market in

to-water-white western extracted honey for which we will pay 8½¢ cash f. o. b. shipping point (about 10¢ to 10½¢ at Medina); also 1 carlot of white clover extracted honey for which we will pay 10½¢ f. o. b. Medina. Samples to be submitted. Not in the market for amber or light amber grades, and not in the market for comb.

No shipments of honey will be accepted under any conditions except as ordered by our purchasing department. The A. I. Root Company.

your locality? Give answer in one word, as slow, fair or rapid.

5. What is the condition of the colonies at present as compared with normal? Give answer in per cent.
6. What is the condition of the honey plants at this time as compared with normal? Give answer in per cent.
7. What is the per cent of winter loss of bees, if any, in your locality?
8. How does the number of colonies in your locality at present compare with last year? Give answer in per cent.

The answers as returned by our honey and bee reporters are as follows:

State	Reported by:	Crop unsold.	In large lots. Comb. Extract.	To Retailers. Comb. Extract.	Move-ment.	Condition. Bees.	Winter Plants.	Colo-nies.
Ala.	J. M. Cutts.....	50....	\$0.08....	.....	.....	.....	.....	.....
Ala.	J. C. Dickman.....	10....	.....	\$5.75..	.90....	Fair..	85..	100..
Ark.	J. Johnson.....	20....	.....	5.00..	1.00..	Fair..	100..	100..
B. C.	W. J. Sheppard.....	5....	.28....	.....	1.75..	Fair..	100..	100..
Cal.	L. L. Andrews.....	.....	.12....	.....	1.00..	Fair..	60..	100..
Cal.	M. A. Sayler.....	10....	.....	3.60..	.75....	Fair..	100..	100..
Cal.	M. C. Richter.....	20....	.11....	.....	1.30..	Slow..	70..	80..
Colo.	J. A. Green.....	5....	.08....	4.60..	.65....	Fair..	100..	100..
Colo.	B. W. Hopper.....	0....	.....	.....	.....	Slow..	75..	90..
Conn.	A. Latham.....	20....	.....	7.00..	.....	Fair..	125..	100..
Fla.	H. Hewitt.....	3....	.08....	.....	.85....	Fair..	100..	100..
Fla.	W. Lamkin.....	2....	.....	3.08..	.75....	Fair..	90..	100..
Ga.	J. J. Wilder.....	40....	.09....	.....	.72....	Fair..	100..	100..
Ida.	J. E. Miller.....	.....	.08....	.....	.60....	.....	.....	.....
Ill.	C. F. Bender.....	0....	.....	6.00..	.....	Slow..	100..	100..
Ill.	A. L. Kildow.....	0....	\$5.25..	.12....	6.00..	1.00..	Rapid.	125..
Ill.	A. C. Baxter.....	0....	.....	6.00..	1.15..	Slow..	90..	75..
Ind.	T. C. Johnson.....	0....	.....	6.00..	1.00..	Slow..	100..	100..
Ind.	E. S. Miller.....	35....	.....	6.00..	1.00..	Slow..	100..	100..
Iowa.	E. G. Brown.....	20....	.11....	6.00..	.85....	Fair..	90..	75..
Iowa.	W. S. Pangburn.....	27....	.14....	7.20..	1.07..	Slow..	100..	.....
Iowa.	F. Coverdale.....	2....	.....	6.50..	.....	Slow..	80..	75..
Kan.	J. A. Nininger.....	.....	.....	6.00..	.75....	Slow..	90..	80..
La.	E. C. Davis.....	20....	.08....	.....	.85....	Fair..	100..	100..
Maine.	O. B. Griffin.....	12....	6.00..	.....	7.00..	.....	100..	90..
Md.	S. J. Crocker, Jr.....	.....	.....	4.75..	1.00..	Slow..	90..	100..
Mass.	O. M. Smith.....	.....	.....	.....	.....	Slow..	100..	100..
Mich.	I. D. Bartlett.....	5....	.....	.....	.75....	Fair..	100..	100..
Mich.	F. Markham.....	10....	.12....	.....	.80....	Slow..	100..	100..
Mich.	L. S. Griggs.....	10....	.12....	6.00..	1.00..	Slow..	100..	100..
Miss.	R. B. Willson.....	8....	.09....	.....	1.00..	Fair..	100..	100..
Mo.	J. W. Romberger.....	0....	5.75..	.11....	6.25..	.95....	Fair..	50..
Nev.	L. D. A. Prince.....	0....	.....	.....	.....	Fair..	.....	100..
N. Y.	G. B. Howe.....	0....	.13....	7.20..	1.10..	Good..	97..	.....
N. Y.	F. W. Lesser.....	0....	.....	4.50..	1.00..	Slow..	100..	100..
N. Y.	Adams & Myers.....	.....	5.75..	.15....	6.50..	1.00..	Fair..	50..
N. Y.	O. J. Spahn.....	10....	.....	.....	.....	Slow..	100..	100..
N. C.	C. S. Bumgarner.....	10....	.....	.....	1.25..	Fair..	110..	125..
Ohio.	J. F. Moore.....	10....	.....	4.80..	.80....	Slow..	90..	90..
Ohio.	R. D. Hiatt.....	.....	.....	6.00..	1.10..	Fair..	.....	100..
Okla.	E. G. Baldwin.....	0....	.....	.....	.....	.....	100..	80..
Okla.	J. Heuelsen.....	0....	.....	.....	.....	Rapid.	50..	75..
Ore.	C. F. Stiles.....	0....	.....	.....	1.10..	Slow..	90..	60..
Ore.	E. J. Ladd.....	5....	.....	5.00..	1.00..	Slow..	100..	10..
Ore.	H. A. Scullen.....	10....	.....	5.60..	1.00..	Fair..	90..	90..
Pa.	H. Beaver.....	7....	.08....	.....	.65....	Slow..	95..	.....
Pa.	D. C. Gilham.....	15....	.....	7.00..	1.00..	Fair..	95..	.....
Pa.	G. H. Rea.....	5....	.....	6.75..	1.00..	Fair..	100..	100..
R. I.	A. C. Miller.....	0....	.....	.....	.....	Slow..	100..	100..
Tenn.	J. M. Buchanan.....	10....	.....	.....	1.00..	Slow..	100..	100..
Tenn.	G. M. Bentley.....	0....	.....	.....	.....	Slow..	.....	100..
Tex.	T. A. Bowden.....	16....	.....	.....	.80....	Slow..	90..	80..
Tex.	J. N. Mayes.....	2....	.11....	.....	.60....	Fair..	75..	60..
Utah.	H. B. Parks.....	10....	.09....	.....	.....	Slow..	110..	85..
Utah.	M. A. Gill.....	5....	.....	4.50..	.60....	Fair..	85..	100..
Vt.	J. E. Crane.....	.....	.....	6.00..	1.25..	Fair..	100..	100..
Va.	L. N. Gravelly.....	25....	.....	3.60..	.....	Slow..	85..	75..
Va.	T. C. Asher.....	5....	.....	.....	1.25..	Fair..	80..	90..
Wash.	C. W. York.....	20....	5.00..	.09....	6.00..	.80....	Slow..	.....
W. Va.	T. K. Massie.....	0....	.....	.....	.....	Fair..	95..	80..
W. Va.	W. C. Griffith.....	0....
Wis.	N. E. France.....	5....	4.80..	.75....	Fair..	100..	100..
Wis.	E. Hassinger, Jr.....	4....85....	Slow..	95..	50..

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1. **Protected Bees work day and night.** It has been shown by careful observation that maintaining a temperature of 98 degrees permits comb-building to go on both day and night. The bees will thus devote more daylight time to gathering honey.
2. **Larger Honey Crops are assured.** The bees are enabled to rear brood earlier in the spring, with no danger of chilled brood on account of cold snaps. One bee in March is worth one hundred in July.
3. **You will practically eliminate winter losses.** With your colonies in normal condition (that is, with plenty of good stores, a young queen and young bees) you will be able to winter practically 100%.
4. **The Inner Overcoat Hive will last a lifetime,** as the outer hive walls are the same thickness as in the single-wall hive. In other words, WOODMAN Inner Overcoat Hives are a lifetime investment—not an expense.
5. **Out-of-door Wintered Bees have many advantages over cellar-wintered bees.** They do not spring-dwindle and are stronger at the opening of honey flow.
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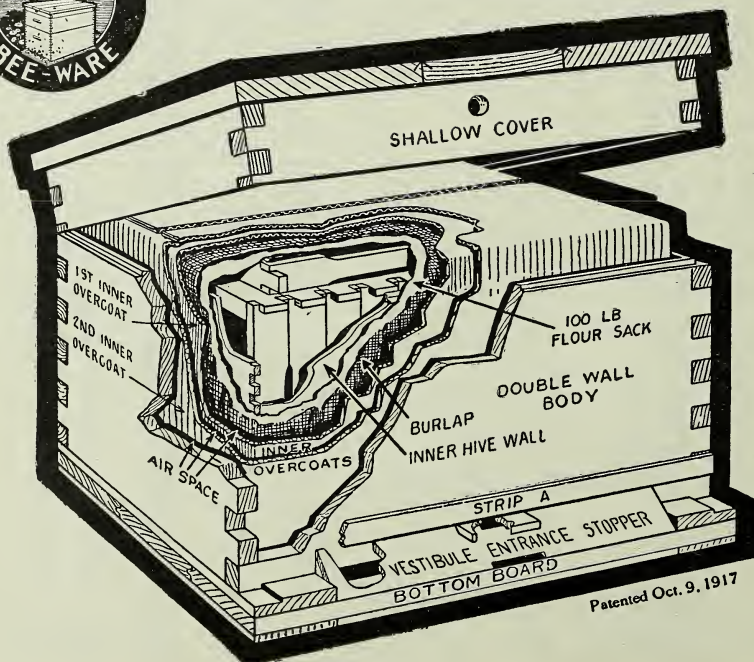
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Crate of five, K. D., 10-frame..... 13.25

Jumbo Size.

Crate of five, K. D., 10-frame..... 14.25

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Hive-Bodies

With Hoffman frames, nails, rabbets.

Standard Size, crate of five, K. D., 8-frame.\$5.20
Standard Size, crate of five, K. D., 10-frame. 5.85
Jumbo Size, crate of five, K. D., 10-frame... 6.85

-0- -0- -0-

Hoffman Frames

Standard Size100, \$5.20; 500, \$25.00
Shallow100, 4.30; 500, 21.00
Jumbo100, 5.80; 500, 28.00

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Medium5 lbs., 68c lb.; 50 lbs., 65c lb.
Thin Super5 lbs., 75c lb.; 50 lbs., 72c lb.

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We carry Aluminum Honeycombs as now
made by Duffy-Diehl Company, in stock
to supply Eastern Beekeepers.

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WOODHAVEN, NEW YORK

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A BRIEF STORY

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Dadant's Foundation was first manufactured for the beekeeper.

Forty-one Years Ago

The Dadant Process of purifying beeswax which leaves the natural odor of the wax and thoroughly cleans it without injuring it in any way was first used and has not to date had an equal.

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The first special foundation mills for making thin and extra thin foundation were devised by us and manufactured especially for us by Mr. Vandervoort of Pennsylvania. Previous to that time all weights of foundation were made on the same mill. This gave to the beekeeper something on which the finest comb honey could be produced.

Twenty-nine Years Ago

We adopted a method of rendering beeswax which left it free from air bubbles and which produced a clear transparent foundation, much tougher than the old cloudy article.

Twenty-five Years Ago

The Weed Process of sheeting beeswax was first used in the manufacture of Dadant's Foundation (ever since the process was available). The only advantage of the Weed Process over our old process is that it makes the production of foundation more rapid.

Every Year

Dadant's Foundation is being improved. Some new kink, some new machinery is added which makes the foundation more nearly perfect and gives to the bees every advantage possible.

This Year

Additional improvements are under way which make for economy for the beekeeper and the very best combs for the bees. These will not be offered until actual tests on a large scale have convinced us first of their practicability. We want the name "Dadant" to stand, as it always has, for a tried and true article which will stand the test of time.

DADANT & SONS, Hamilton, Ill.

GLEANINGS IN BEE CULTURE

MARCH, 1922

EDITORIAL

AS mentioned last month we expect to publish the list of donors to the Dr. Miller Memorial Fund



The Miller Memorial Library Fund.

in the April issue, making it complete up to the time of going to press. This will enable us to include the amounts donated by the various beekeepers' associations during the winter, either as associations or as individuals, who made their contributions thru the secretary of an association. Gleanings has not heretofore published a list of donors to this fund, chiefly because the list has been constantly growing.

The committee having charge of this project have not set a time limit for contributions, but we have definitely decided to publish the list next month. In order that this list shall be as large as possible all contributions should now be sent promptly in order that the names may reach this office in time to be printed next month. The funds are in charge of C. P. Dadant, Hamilton, Ill., who is chairman of the committee, but contributions may be sent to any member to be forwarded to Mr. Dadant. The other members of the committee are Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C.; E. G. LeSturgeon, San Antonio, Texas; B. F. Kindig, East Lansing, Michigan, and E. R. Root, Medina, Ohio.

We understand that this committee will soon make some important announcements in regard to plans for the Dr. Miller Memorial Library, now being considered.

In order that the names shall reach this office in time to be printed in the April issue it will be necessary to send them early in the month, especially those which are not sent direct. All names should be here not later than the middle of March, if they are to appear in the list.

SINCE the editorial comment on aluminum combs was made in the February issue of this journal, several letters have



The Aluminum Honeycombs.

been received scolding the Editor for not discussing more fully the advantages and disadvantages of these combs.

Our readers may rest assured that if these combs prove to be certainly advantageous in honey production, Gleanings in Bee Culture will point this out immediately.

The stand that the Editor takes at this time, judging from his own experience and from reports received, is that aluminum combs are still in the experimental stage, and may never get out of that stage. They are accepted by the bees and filled with honey, altho the bees show a decided preference for natural combs. Brood is reared in them, but under some conditions only a part of the brood will develop, the combs often having a spotted appearance as if the queen was failing. Probably this is partially responsible for the difficulty experienced in the attempts to winter colonies on these combs in the North, tho no doubt the rapid conductivity of heat by the metal is the chief cause of this trouble, aluminum being one of the best conductors.

It now seems that if these combs should ever come into general use it will be for extracting combs instead of for brood-combs. They are not easily broken in the extractor, yet they require careful handling, for, unlike natural combs, the bees are not able to repair them when the cells are injured by rough handling. The larvae of the wax moth are not able to destroy these combs, but when they are exposed these larvae spin their cocoons in the spaces between the metal and the frame, sometimes destroying the frames by cutting away wood, besides injuring the combs otherwise.

Perhaps these difficulties can be overcome after further experiments, and, no doubt, aluminum combs will give better results in some climates than in others. It would certainly be unwise for any beekeeper to install an extensive equipment of metal combs without first trying them out thoroughly on a small scale for his conditions.

ACCORDING to reports of the Bureau of Public Roads of the United States Department of Agriculture 11,930 miles of roads were constructed under the joint supervision of the Federal Govern-



Good Roads and Beekeeping.

ment and the states in 1921. The projects under way during the year amounted to 31,228 miles, or more than enough to encircle the earth. This represents only a part of the road work carried on in the United States during the year. While these good roads are not always built where the beekeeper needs to go in his out-apiary work, in many cases they open up new territory for outyards and greatly simplify their operation. In fact, good roads, automobiles and swarm-control are three great factors in the large increase in out-apiaries during recent years.



THE figures given by producers on our market page, as to number of colonies, show a



More Colonies of Bees Than Last Year.

substantial increase over that of a year ago. In a few cases a decrease is shown, but these are offset

by the many cases where there is a gain. Since these figures reflect, to a large extent, conditions found among commercial honey producers they indicate a spirit of determination in beekeepers as they adjust themselves to new conditions. While on first thought an increase in the number of colonies may suggest that the country may produce too much honey for advantageous marketing, it is well to remember that there is also a danger of producing too little to develop properly the consumption of honey. As a result of all the agencies that have been at work during the past six or eight months pushing the sale of honey, a great multitude of new consumers have learned that honey is good and that it leaves a taste for more. When beekeeping finally comes into its own, this country will produce many times the amount of honey now being produced, and honey will be better known to the American housewife than it is now.



ON PAGE 165 of this issue C. E. Bartholomew mentions the disappearance of queens



Disappearance of Queens in the Tropics.

as one of the difficulties of tropical beekeeping. Similar reports have come from Porto Rico as

well as other tropical countries, even when the colonies are requeened annually. Mr. Bartholomew points out that it is the young and most prolific queens that most commonly disappear. This loss of queens, often occurring when the bees are not rearing brood, causes serious winter loss, frequently much greater than the winter losses in the far north. Why so many young queens should disappear is a baffling question that should be answered if possible.

Do laying queens sometimes risk their lives by taking a flight in the sunshine when

they are not busy laying eggs? Mell Pritchard, queen-breeder for The A. I. Root Company, says that they do. He says that it is not uncommon for laying queens to take flights in late summer or autumn when they are not busy laying eggs. He has seen laying queens do this again and again, but always late in the season when they are laying but little if any. Perhaps this is more common in the tropics where the queens are idle for two months when the weather is fine for flight. In the north, the queens can not "take the air" during their idle months of winter because of cold weather, and during the summer they are too busy for play. It might be well for tropical beekeepers to pen the queens in their hives by means of entrance-guards, while they are not busy laying, to see if this would reduce the number that disappear. Perhaps clipping their wings would answer, tho, no doubt, an entrance-guard would be safer.



THOSE who winter their bees in the cellar can now tell with considerable accuracy how



Setting Bees Out of the Cellar.

their colonies will winter, even tho they may be left in the cellar another month or more.

If they are quiet now and show no signs of dysentery, they should come thru in good condition. If they are restless and spot the hives around the entrance they have already wasted themselves badly and cannot come out in the best condition, for their restlessness will increase from this time on until they are set out and have had a cleansing flight. About all that can be done now for bees that are restless is to try to keep them from flying out of their hives by lowering the cellar temperature.

Formerly great stress was placed upon the time and the manner of setting the bees out of the cellar in spring; but, since better cellars are being built and cellar wintering is better understood, there is less complaint about the two great difficulties of cellar-wintered bees in former years—drifting and spring dwindling. Bees that have wintered well in the cellar are not so much inclined to drift during their first flight as bees that have wintered poorly. Bees that have wintered well in the cellar should not be troubled with spring dwindling. In fact, they should be even better able to endure cold spells during the spring after they are set out than bees wintered outside. It was formerly thought that the bees wintered outside were hardened by the winter and that this hardening enables them better to endure cold spells in the spring, but apparently this is not true. Since cellar wintering is better understood, beekeepers are setting the bees out in the spring earlier than formerly thought advisable, and there is less anxiety about choosing exactly the right

kind of day for this work. Probably most of the cellar-wintered bees will be set out this year the latter part of this month instead of in April, especially if the weather is at all favorable for so doing at that time.

A few simple precautions are usually sufficient to prevent drifting if the bees have wintered well, such as airing the cellar the night before the bees are set out, handling the hives carefully when carrying them out and contracting the entrances before the bees begin to fly. Many beekeepers now prefer to set the bees out at night or on a day too cold for them to fly so they will not rush out of the hive during their first flight, as they are inclined to do when set out on a warm day. By consulting the daily weather map it is usually possible to have notice a few days in advance of an approaching warm spell. Those who are not able to interpret the weather map should consult the teacher of physics in the local high school, who should be able to do this.



WITHIN recent years there has sprung up a new type of beekeeping, which is rapidly placing the indus-



The New Beekeeping.

try on a safer basis than heretofore. Even in regions formerly thought not to be suitable for honey production on a commercial scale because of so many seasons of failure, "the new beekeeping" is quietly creeping in and paying crops of honey are being harvested. Honey is now being shipped in carload lots from localities formerly thought to be too poor for commercial honey production. Some say that the seasons are growing better, especially in the eastern portion of the country. So they are for those who have taken up "the new beekeeping."

What is this thing that is now sweeping over the country, converting poor localities into fair ones and good localities into splendid ones? The answer can be put into two words—better management. During the past 10 or 15 years great strides have been made in management to produce great colony strength at the right time to take advantage of the honey flow. For 30 years or more previously, beekeepers were so engrossed in the development of apparatus that some of the essential things in management were overlooked. Many beekeepers were so busy inventing new hives and appliances, designed to force nearly all of the honey into the supers, that they failed to see how this was leading to smaller colonies at the beginning of the main honey flow. Fortunately, the emphasis has changed from hives and fixtures to better management. This does not necessarily mean that hives and fixtures have reached perfection but that beekeepers are learning that equipment can not take the place

of management. The result is much stronger colonies at the beginning of the honey flow than were formerly thought possible. It seems to have taken unnecessarily long for this change to come about, and the industry, as a whole, still has a long way to go in this respect.

"The new beekeeping" does not leave to chance anything vital to the prosperity of the colonies that can be taken out of the realm of chance. It demands in August normal colonies headed by a good queen, preferably young, and plenty of food. It demands that the colonies be put into as nearly perfect condition as possible for winter, even tho the latter part of the season is unfavorable for brood-rearing. It demands that each colony be supplied with an abundance of stores at the beginning of winter, and in the north where bees are confined to their hives for long periods, that the winter stores be of the best quality. It demands that these conditions be in all colonies at the beginning of winter and not in some of them. While such colonies are hard to kill by winter exposure "the new beekeeping" provides adequate winter protection for the severest winter every year instead of for the average winter.

In the spring "the new beekeeping" demands that every colony be given every opportunity to build up quickly to the greatest possible strength for the honey flow. When Doolittle pointed out the value of "millions of honey at our house" for this building-up period, together with an abundance of room in the form of good worker combs for brood-rearing, he pointed the way for "the new beekeeping." This new beekeeping takes no chances on nature furnishing enough food during this critical time, but every colony is supplied with a large reserve of honey—from 15 to 50 pounds.

"The new beekeeping" completely controls swarming, and during the honey flow conditions are brought about to induce the bees to work with the greatest possible spirit.

Of all things which help to bring about uniformly strong colonies at the beginning of the honey flow and therefore bring success in honey production, the big and outstanding one is a great abundance of reserve stores, especially in the spring when workers are being reared for the harvest. Those who provide a second story two-thirds filled with honey as a food chamber at this time and permit the queen free range thru both stories are reaping rich rewards for doing so. In many localities this food chamber with its "millions of honey at our house" converts poor localities into good ones and practically eliminates poor seasons in ordinary localities. "The new beekeeping" is based largely upon this safety device. The food chamber, together with the slogan "millions of honey at our house," is now working miracles in honey production.

TIME is a very important factor in successful beekeeping practices. Good management and the proper planning of work will bring about conditions where it is possible for us to avail ourselves to the fullest extent of the time factor.

Why is time such an important factor in beekeeping, and why should we place so much emphasis on this fact? It is because we deal with a colony of bees that can be worked at certain times only. Such times are relatively short and are, generally speaking, during periods of honey flows. Work at such periods, then, must be definitely planned beforehand, so that it may progress rapidly, smoothly and intelligently. There are many days during April and May when our time may be valued at several dollars an hour. Working weather with the bees during honey flows utilizes our most precious moments. We must do everything in our power so to arrange our work that our best energies may be expended with the bees themselves. A realization of this is of the utmost importance, and it is the purpose of this article to place special stress upon this fact.

Of course, there is a considerable amount of work to do with bees when they are inclined to rob, but the work can be minimized surprisingly thru proper management. We all unite in saying that there is no better time to work bees than during a honey flow. Let us then plan our work so that we may take advantage of this most important consideration.

In early spring, as far as it is possible, everything about the apiary buildings, the equipment and yards should be in readiness for the season's work. We will describe how our plant is arranged, but the reader must bear in mind that the description is useful only in so far as it is of value as a time-saver. The plant is a home extracting plant, located on a sage range and run for extracted honey. The apiary buildings consist of a warehouse (storage room for equipment), extracting room, tank room, shop, garage and wax-house.

The Warehouse.

The warehouse is amply large enough so that it will accommodate, without crowding, sufficient honey cases, extracting supers, tops, bottoms, excluders, etc. The arrangement of the equipment in the warehouse is such that each particular kind of equipment is set off in separate piles. We will take, for instance, the item of extracting supers. There are in the warehouse in March the following: (1) pile of supers containing No. 1 brood-combs, 10 to the super, this pile be-

THE TIME FACTOR A BIG ONE

Importance of Being Fully Prepared for the Rush Season. Yard Work Should be Done During Honey Flow

By M. C. Richter

ing limited in number to about one-third as many supers as we have colonies of bees; (2) pile of supers containing either No. 1 or No. 2 brood-combs containing eight combs to the super, this pile consisting of about three supers to every colony of bees that we possess; (3) pile of supers containing 10 frames of foundation each to the super, this pile consisting of one and one-third supers to every colony of bees. There are, perhaps, other piles, such as supers with wired or empty frames, or the empty supers themselves. In like manner there are separate piles of tops, bottoms, excluders, escape-boards, moving screens, nucleus boxes, etc.; but in each instance each pile is easily accessible and at a moment's notice may be made available to a waiting truck at the doorway. It need hardly be mentioned, I hope, that all supers, tops, bottoms, etc., must be in proper shape before being placed in piles. It is important to maintain an inventory of the various piles.

Extracting Room and Garage.

The extracting room joins the storeroom and adjoining this is the garage. They are all under the same roof. When a load of supers containing honey arrives at the plant, the truck is driven into the garage and the doors are closed. The supers are then carried into the extracting room (a door opens from the garage into the extracting room). During extracting, the empty supers, as soon as filled with wet combs, are placed directly on the truck and are thus ready to go to a yard when the proper time arrives. Here is a saving in the handling of a super of at least once and at a time when time is so valuable. There can be no robbing since both rooms are bee-tight.

When honey flows are rapid, the extracting outfit must be capable of handling at least a daily output of two to three tons. This is easily obtainable today with our modern appliances.

Shop and Wax House.

The shop is a corner in the storeroom and must be fitted so that it will take care of ordinary repairs in the extracting room and on the truck. Tools must always be replaced after being used, and the shop must be kept in order at all times. Endless time is lost during the busy season, if this important rule is not observed.

The wax-house is a building by itself, sufficiently removed from the other, on account of the danger from fire. This house may also serve for the purpose of handling American foul brood. Old, broken and diseased combs and scrapings are rendered into wax after the extracting season is over. The same

holds true for all hive materials contaminated with American foul brood. This phase of the business can wait until the more pressing work of extracting is over. Cappings or wax from the capping melter may be refined with all other wax at the season's close.

Auto Truck.

Regarding the truck, it should need a certain amount of overhauling during the winter according to the amount of use to which it has been put. If used extensively it should be turned in for a new car every other year. It cannot be overemphasized that the auto truck must be in excellent mechanical condition for the season's work. A breakdown during the busiest part may prove very disastrous, and the upkeep and care of the car must be ever so closely attended to. Strict attention to this allows us more time for manipulation in the yards. Another factor is that the truck should be fast, and we know of no other truck that

partial or total dearth of incoming nectar, if the yard be in excess of 100 colonies; (3) the greater ease and rapidity with which a yard may be worked when there is very little inclination to rob; (4) as a disease-control measure; and (5) a truck load, taking all things into consideration, handles a yard of this size to the best advantage.

When possible the colonies are arranged in double rows, leaving a driveway between each pair of rows. This plan reduces the carrying of supers to and from the truck to a minimum. The hives themselves must sit level, but may slant slightly towards the front. If they do not sit true, combs drawn from foundation will conform more to Newton's law than to the form of the Hoffman frame. The result would be not only an imperfect comb but a loss of time in colony manipulation.

Colony Manipulation.

We all have a fairly good idea of what constitutes working weather with the bees.



Typical sage country of California.

can do our work better than the Reo. A speed of 35 miles per hour with a full load on a paved highway is a great saving of time. Smokers, veils, hive-tools and fuel should be so arranged upon the truck that they are held securely, well protected and very accessible. Care must be exercised to protect a hot smoker from fire danger.

Before the season opens there should be enough fuel on hand to last thruout the busy season. We use burlap cut into proper lengths to fit the smokers. This fuel is stored where it may be drawn upon each morning before the truck starts on its daily run.

Yards and Their Arrangement.

We do not like to keep more than 75 or 100 colonies in a yard. There are several reasons: (1) During spring manipulations two men can get thru a yard in good shape on a fairly good bee day; (2) the demoralizing effect that it begins to have upon the yard when visited the second day during a

If we had but a few colonies there would be nothing to hinder us from working them always in ideal weather and everything would proceed beautifully. But, alas, when colonies run up into the four figures, often we must do a certain amount of work which is performed with great reluctance. It is an unpardonable sin, if traceable to faulty management, to arrive at a yard, we will say, at nine o'clock in the morning when bee weather actually commenced at eight o'clock. Again, it is little short of a crime to arrive at a yard with too few supers of foundation, tops, or excluders, or whatever other equipment might be needed. It would be all the more unpardonable to commence work with an asthmatic smoker, leaky veils or no hive-tool. The spring work is always planned in such a way that we spend the warm, sunshiny hours of the day with the bees, and we are at times in two or more yards during a single day. It is our endeavor to bring about conditions among the

bees so that we must manipulate them as little as possible.

The preparation of bees during the fall of the year, as outlined in last month's article on the "Orange Flow in California," showed that under ordinary conditions no further attention was required until the colonies had bred up to nearly their full strength. When they have about reached the point where they might swarm, they are treated to prevent swarming. Thenceforth, as an aftermath of the swarming treatment, they are requeneed and examined for purposes of giving more room or taking off honey according to the character of the flow.

Thus, it is seen that normal colonies under ordinary conditions are manipulated but little. Colonies that require the least spring work produce the most honey. Unfortunately, however, it is impossible to keep all colonies normal, and still further impossible to control abnormal weather conditions

which bring about a greater amount of manipulation. For this reason and, likewise, for the reason that colonies vary so greatly as to the time when they approach the treatment for swarming, we must spend all the time we can get with the bees.

What is more important than doing the right thing at the right time? The difference between today and tomorrow may mean the difference between 50 pounds or 150 pounds to any individual colony. If we can so plan our work that we have made it possible to squeeze in an extra 20 or 30 or 35 minutes more per day actual working time in a yard, then we know we are working in the right direction. As we become more proficient, our bees will be kept better and soon we can keep more of them. Much that is written herein, you have read often. To plan in order to save time is obvious. Yet why is it that we heed so little that which is so obvious?

Big Sur, Calif.



TEN years ago a honey-house or a honey-building of any description costing thousands of dollars was of rare occurrence. Likewise, even five years ago, a five or six horse-power steam boiler was not considered a necessary part of the extracted-honey producers' equipment. Today both are common.

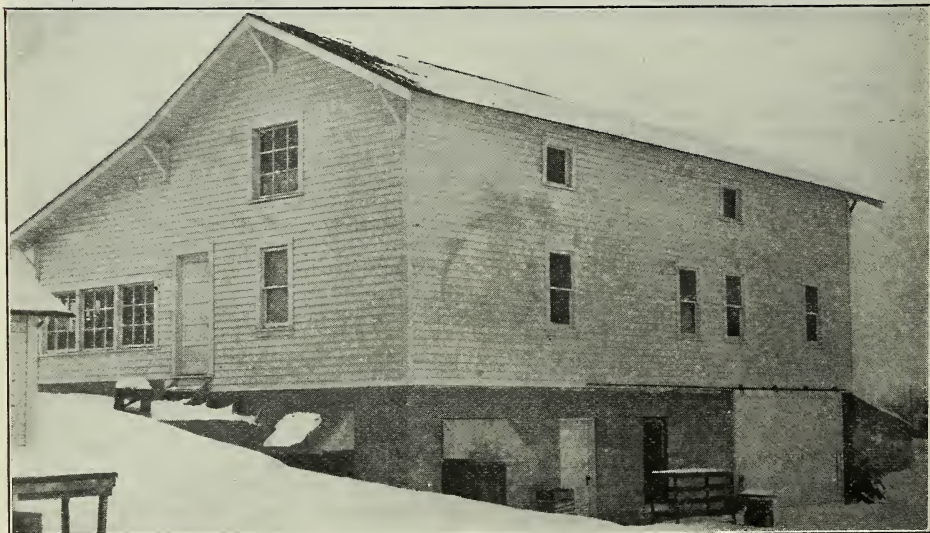
SOME WESTERN HONEY-HOUSES

Permanently Equipped Central Extracting Plants Becoming More Common. Importance of Room and Light

By H. H. Root

We find, of course, a variety of opinions in regard to the proper construction of buildings for beekeepers' use. One producer, to keep down expense, will

construct the cheapest shed that can be made bee-tight (and not all of them are bee-tight), of a size just large enough to house the equipment and a few supers of



Honey-house and workshop built by Roy Rabbitt, Caldwell, Ida. It has plenty of room and plenty of light.



Rear view of Roy Rabbitt's honey-house and workshop. The garage is located in the basement, the trucks having access by driveway to the middle story.

combs. Like the Israelites of old when a move to new pastures becomes necessary, the beekeeper can easily pick up and go, for the shed itself can be moved or it can be sold without much loss.

More and more the central extracting plant is coming to the front, owing to the improved roads and to better and cheaper trucks. Among the central-plant advocates we find a group who believe in constructing a building ample for their requirements, but of such a shape and style as to be readily reconstructed into a garage, barn, or even into a dwelling house, in case a move becomes necessary. In this way the property can be disposed of without great loss.

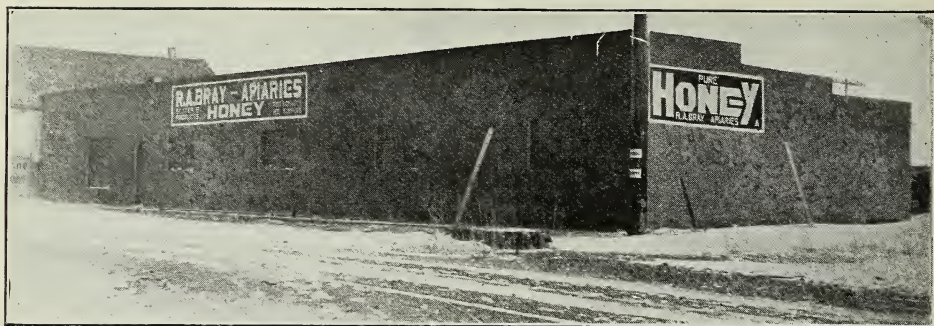
Then there are other beekeepers who believe in constructing a special building of

a type exactly suited to their needs. This group seems to be increasing—a testimony in favor of the increasing stability of the honey business.

Roy Rabbitt of Caldwell, Idaho, has a very fine building. Mr. Rabbitt produces both comb and extracted honey, and his building is well adapted to the needs of both. Counting the basement, there are three floors. Because of being built on a sidehill, the first and second floors are on the grade line. Mr. Rabbitt has rooms for special purposes, including a garage for two trucks, workrooms, rooms for the storing of supplies, warm rooms for the storing of comb honey, etc. He has an abundance of light and electricity for both heat and power. By the way, Mr. Rabbitt



A creamery converted by H. M. West of Parma, Ida., into a honey-house. It was already provided with a horizontal boiler of good capacity, an insulated room, plenty of tanks, etc. A truck may be backed up to the basement or up the incline to the main floor.



R. A. Bray's solid concrete honey-house at Big Timber, Mont. Mr. Bray lost a former honey-house by fire, hence when he built new he adopted fireproof construction thruout.

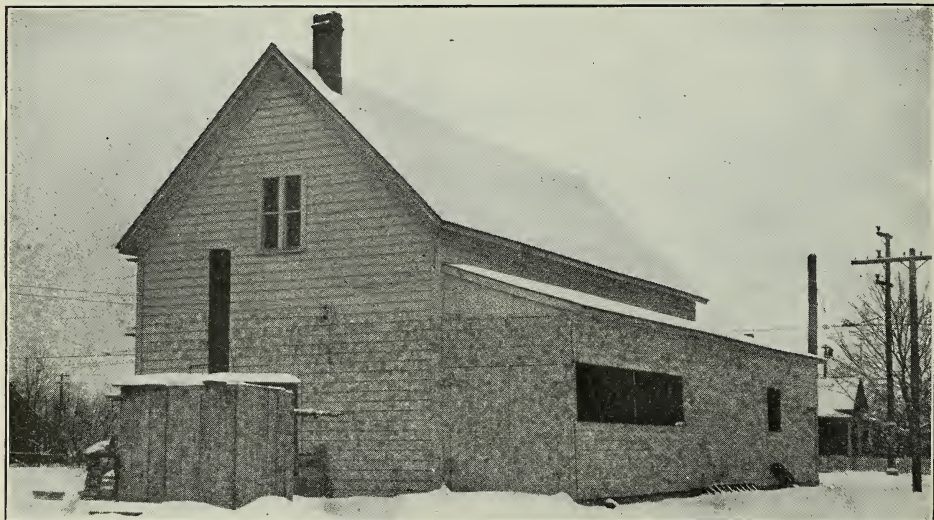
buys all of his supplies, as he figures that his time is worth more in other ways during the winter than in the construction of home-made appliances.

H. M. West of Parma, Idaho, was very fortunate in securing an abandoned creamery building all complete with steam plant, insulated room, etc. It is an ideal building for his extensive extracted-honey production. I do not feel that any power extracting plant is complete without a fair-sized boiler for steam. In extracted-honey production it is really indispensable. Most of the honey-houses in the Inter-Mountain district have these boilers in sheds adjoining the building, or, in some instances, right out in the open air. A 5 or 6 horse-power boiler is ample; the amount of coal used in a season is almost negligible; and, besides, there is an abundance of steam for every purpose. Mr. West has a large horizontal boiler, one firing of which gives him all the

steam he can use for several hours. He was fortunate in securing this old creamery.

J. M. Stark of Middleton, Idaho, has a commodious well-built honey-house right in town. A good-sized boiler at the rear keeps him supplied with steam. He can drive right into a shed adjoining the building. Long windows in the side and front of his house furnish an abundance of light.

R. A. Bray of Big Timber, Mont., some time ago had a disastrous fire, in which he lost his building and everything in it, saving absolutely nothing except a honey pump, which, being full of honey at the time, was not injured by the heat. His new building is constructed of solid concrete, and is a model structure in every way. It has concrete floors thruout and abundance of light, water, steam and all modern conveniences. One room is partitioned off for an office, another for the boiler, extracting equipment and tanks, while the rest of the



J. M. Stark's honey-house, Middleton, Ida. The vertical steam boiler in the shed outside furnishes ample steam for all purposes.

building is left for the storage of supplies, for his garage, etc.

One thing that impressed itself on my mind most forcibly when visiting these western beekeepers is the fact that room and light, plenty of both, are considered indispensable, and I am sure that they pay for themselves in the saving of labor. No one can do efficient work in dark, small, poorly ventilated rooms. The outdoors of the West seems larger and loftier than that of the East. Perhaps that is the reason why buildings used by the western beekeepers average larger than those used by eastern beekeepers.

In this brief article I have not attempted to give floor plans. I have seen extracting rooms by the score, but I have never seen two arranged just alike. This is not sur-

prising. There are possibly 700 kitchens in Medina, and while some of them are the same in size and shape no two of them are arranged alike inside. The habits and ways of individuals are different, and so are the conditions. Just as no uniform arrangement of a kitchen would fit all conditions or suit all women, so no one arrangement of an extracting room will answer all requirements nor suit all extracted-honey producers. The floor plan, therefore, in my opinion can best be arranged by the beekeeper himself, who contemplates the construction of a building. In the next number, however, I shall have something to say in regard to the arrangement of extracting equipment. I shall discuss the various forms and parts of the equipment used.



IN the September issue of *Gleanings* I described our underground concrete bee-cellar, showing interior and exterior views of it. On the last

day of November we finished putting the bees in this cellar for the third time since the cellar was built. Generally we have put our bees in the cellar about the middle of November; but, owing to the late fall and continued warm weather, we were able to leave them out much longer last fall.

Requires No Attention During Winter.

We moved to our winter quarters in Albany on December first, and I have not been able to visit our cellar more than twice since coming to town. At both times I found the thermometer at 48°F., the cellar free from moisture and the bees quiet. During the past two winters this cellar has held its temperature from 48° to 50° with not more than two degrees variation and with no attention whatever.

Last winter and the winter before we experienced less than a two per cent loss, which loss was mostly due to the poor condition of the bees at the time of going into the cellar. I believe that if we could be sure that all of our bees were in perfect condition for wintering when placed in the cellar, this cellar would winter one hundred per cent perfect without one moment's attention from December till April.

I certainly think that if some of our brother beekeepers, who practice wintering outside, either in packing cases or on their summer stands with the wind and snow as their only packing, could try out, for just one winter, a satisfactory cellar such as ours

WHEN AND HOW TO SET OUT

Take the Bees from Cellar in March, and Do It at Night. Sort the Colonies in Groups

By D. L. Woodward

has proven to be, they would never return to outside wintering. Outside wintering has some advantages, but they are so few, compared with the advantages

of a good cellar, that they are not worth mentioning.

We are wintering, this year, 307 colonies in this cellar. It took one man just one day to wheel the 300 colonies into the cellar and tier the hives up five high. The doors are locked, there is no more worry for us, and the bees are warm and comfortable.

When to Take Bees from Cellar.

If the latter part of March proves no exception to the past two or three years, our bees will come out of the cellar about March 20. For a number of years we have been waiting until about April 5 to 15 to take them out, or until the weather becomes somewhat settled. We now plan to have our bees on their summer stands the first seasonable weather after March 20.

It is generally supposed, if bees are taken from the cellar too early, or before the weather is settled, that they are apt to receive a setback during the early part of April. Our experience for a few years past has proven to us that whatever setback they may receive at this time, they are still in the lead when the honey flow starts, which is about June 10 with us.

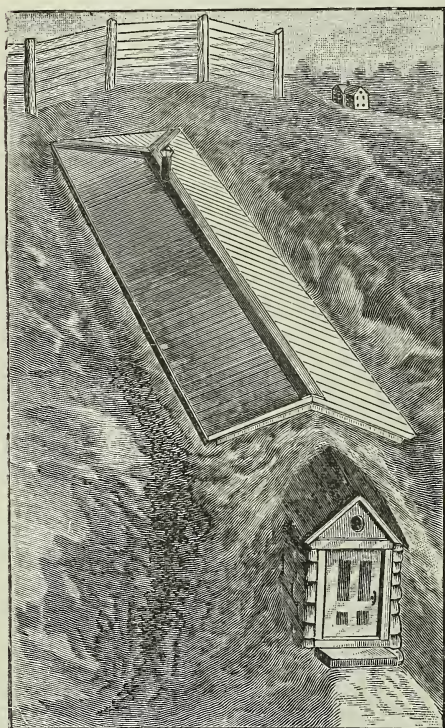
A couple of years ago we took out 50 colonies the latter part of March. The bees had had several good flights when we awoke one morning to find a foot of snow on the ground and a blizzard raging.

The snow drifted and covered most of the hives, so that we could discern where

the rows were only by the little mounds of snow. A week of genuine winter weather followed, but the bees suffered no harm, and when the honey flow came on these were our strongest colonies. Experience has taught us that, if the bees can have a week of good weather with several flights during that time, they are in shape to withstand any bad weather that may follow.

Advantages of Setting Bees Out at Night.

Many beekeepers remove their bees from the cellar during the day, but we prefer to take them out at night, with the prospect of a cool and cloudy day to follow, so that the bees will not try to fly until the next warm day. Then they will start out gradually as the heat of the sun warms the hives



A familiar picture—the underground bee-cellar of the late G. M. Doolittle; one of the first of its kind.

from the outside and assures the bees that it is safe to venture forth. In this way there is no mad scramble to get out for the first flight, the bees fly out gradually, marking their location as they go out, and there is very little drifting.

We do not try to remove our 300 colonies all in one night, but take several evenings to do the work. Sometimes a week will intervene between the first and the last lot taken out. Therefore there is less confusion in the yard, the following day, than if all were removed on the same night.

In handling the work in this way it is best to fill out all rows started each night in order to start at the end of a new row the next night; otherwise the bees in the hives near the ends of the rows will have marked their location, and when the row is continued the following night, these bees will become confused upon flying the following morning, to find that their home is in the middle of the block instead of on the corner.

Each morning after moving a lot of bees from the cellar, we proceed to clean out the entrances, put in the alighting-boards, and contract the entrances to about one inch, which keeps out the cool night air and helps to prevent robbing.

I have often been asked if there is no danger of robbing when bees are taken out in this way. All I can say is, that we have never had any trouble from this. No doubt if one is careless he would have trouble; but, if proper precautions are taken, there will be no robbing on this account. I think that if some who practice cellar wintering and taking their bees out during the day, will try the night trick, they will be convinced that it is far ahead of the daylight plan. They will have no flying bees, no gloves nor bee-veil to contend with, and the work is done during the coolest part of the day.

If you can not pick a moonlight night for the work, bring Henry around to the yard and let him cast his eagle eyes over the yard, which will answer just as well.

Separating Colonies of Different Strength.

In putting our bees into the cellar we arrange them in three classes—heavy, medium and light. The heavy ones are placed on the two bottom rows, the medium ones next and the light ones on the top. There are two reasons for this: one is to save lifting the heavy colonies so high, and the other is, that the colonies near the ceiling will not consume as much honey as the colonies next to the floor.

With us light colonies mean weak colonies, that is to say, that they were found weak in bees and light in stores at the last inspection in the fall. Colonies that were light but strong in bees were attended to at that time; but those that were weak in bees, and light, were considered to have enough stores to carry them thru till they could be attended to in the spring. If not, they were given enough feed to carry them thru the winter.

In taking the bees out we proceed to place our light colonies, which we know to be the weaker ones, on the stands in the front rows of the yard, as we have found that the front rows of any beeyard generally contain the strongest colonies in the fall, due to the fact that the bees from the back of the yard coming in heavily loaded will often drop down and enter the hives

at the front of the yard. Likewise in moving bees to our outyards we always try to set the weaker colonies at the front of the yard, so that they will catch these workers which help to strengthen them.

Our medium colonies are then placed in the center of the yard and the heavy colonies at the back. Now we have the yard classified, and we know just which colonies need immediate attention without going over the whole yard.

On the first warm day that is suitable we proceed to go over the light colonies to ascertain if they have enough stores to carry them thru till the honey flow starts. If we find that some are short of stores, and we have not provided for this emergency

by saving combs of honey, it is an easy matter to borrow some from the heavy colonies of the yard, provided they have no foul brood. If there is disease in the yard, this becomes a dangerous practice. After taking the bees from the cellar they should not be disturbed until the weather is settled, unless it is absolutely necessary. Care should be taken not to loosen the sealed covers, and let in the cold air at the top of the hive, as the bees cannot seal them up again at this time of the year.

When the apple blossoms bloom, we don our white suits and bee-veils, and the fun begins. I know that you are all anxiously awaiting the blossom time.

Clarksville, N. Y.



WHEN I was assistant in beekeeping at the Wisconsin College of Agriculture, and also queen-breeder at that institution, I determined to

study royal jelly or larval food, to find out, if possible, just wherein lay its great nutritive value. In searching thru all the chemical and bee literature, I was able to find only one person who had tried to throw light on this subject. Dr. Adolph V. Planta in 1888-1889 published an account of his investigation in "Zeit. f. Phys. Chemie." His chemical analysis, however, is only an elementary analysis.

Larval Food in Drone and Worker Cells.

It has been often stated that it takes two or three workers to support a drone. This may still be true, but I felt that a little investigation into the feeding of the drone and worker larva would not go amiss. The work was done during the clover honey flow, when the amount of larval food, supplied to the young workers, is at its maximum. Every beekeeper has seen that in early spring the larvae are fed more sparingly. Two average colonies were chosen in order to have a check on the weighings that were to be made.

The larvae from 100 worker-cells and from 100 drone-cells were removed. As nearly as possible, larvae were chosen of about the same age. The larval food was removed from the cells and placed in watch glasses, that were kept covered to prevent evaporation. This was done with each colony, great care being taken to have the watch glasses properly numbered. The larval food adhering to the larvae could not readily be removed, so that the results are only approximate, yet they give us an idea as to the

TREMENDOUS GROWTH FORCE

Investigations Reveal the Food Miracle in Royal Jelly. Drone Eats Five Times as Much as Worker

By C. W. Aeppler

relative quantities in each case.

Before the larval food had been placed in the watch glasses these had been carefully weighed on analytical balances on

which one can weigh a ten-thousandth part of a gram (a gram is about 1/28th of an ounce). In other words, one can weigh a grain of dust on such a balance.

After the watch glasses containing the larval food had been weighed, the weights of the empty glasses were subtracted in each case, and the results were as follows:

DRONE CELLS—Colony A: 100 cells contained 1.046 gr. larval food, or .01046 gr. per cell. Colony B: 100 cells contained 1.0974 gr. larval food, or .01097 gr. per cell.

WORKER-CELLS—Colony A: 100 cells contained .1843 gr. larval food, or .001843 gr. per cell. Colony B: 100 cells contained .1970 gr. larval food, or .00197 gr. per cell.

From the above results it can be seen that a drone-cell contains about 5.5 times as much larval food as does a worker-cell. These figures speak emphatically in favor of full sheets of foundation to suppress the rearing of drones.

Chemical Analysis of Royal Jelly.

The greatest obstacle to be met in making a chemical analysis of larval food or royal jelly is the small amount of the material that any chemist can secure. Larval food is about 70% water. Cows' milk is about 87% water. The 30% solid material in larval food suggests the difficulty in obtaining enough for analysis. It took me two years to obtain enough larval food to conduct the analysis and feeding experiments. This larval food was obtained during the summer of 1915 and 1916.

As the larval food was removed from the queen-cells, it was placed in watch glasses,

and dried over sulphuric acid in a dessicator. In addition to this, the air was pumped out of the dessicator once a day, in order to draw off any moisture that escaped from the larval food. In this way it dried very quickly, yet without any heat or chance of fermenting. Instead of being white or grayish white in color, it was now light amber in color, hard and brittle. The color was not due to chemical change. The solids had merely been concentrated.

I was unable to collect much more than a water glass full in dry condition the first summer, altho a lot of queen-cells were started in order to secure enough of the material to make the analysis worth while.

In the spring of 1916 I wrote 180 letters to as many beekeepers in every nook and corner of Wisconsin. I asked them to save all the queen-cells that they possibly could, removing the larvae, and sending the cells to me as soon as possible, after removing from the hives. About 30 beekeepers responded, and with what I received from them, together with that secured from the University queen-rearing yard, I had succeeded by fall (1916) in obtaining the larval food from about ten thousand queen-cells. The beauty of it was that it came from many sources, and any analysis conducted with it would be a good average of larval food as it exists.

In carrying out the chemical analysis, I had the co-operation of another student, E. G. Gross, who performed the analytical work.

The elementary analysis that had to be conducted, checks very well with the results of Dr. Adolph V. Planta, as obtained between 1885 and 1888. Dr. E. F. Phillips in his book, "Beekeeping," doubts the results of Dr. Planta, but we found them to be correct. However, his analysis is only an elementary one. No compounds were isolated, therefore, no conclusion can be drawn as to wherein lies the nutritive value of larval food.

The first procedure was to determine the different groups of organic and inorganic compounds, viz.: protein, fat, sugars and ash

(mineral matter). The following results were obtained:

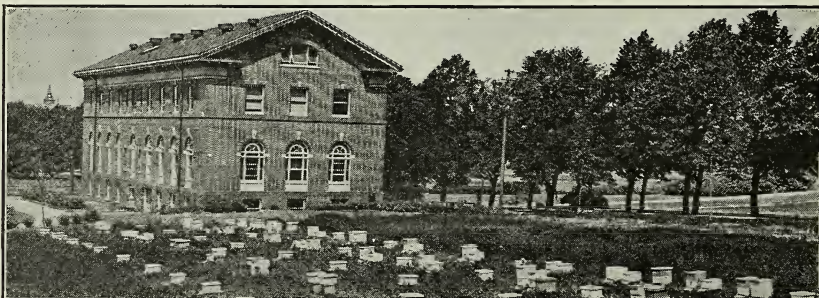
COMPOSITION OF LARVAL FOOD IN AIR-DRIED CONDITION.

Moisture after drying at 100°C.....	24.15%
Total nitrogen	4.58%
Total protein (factor 6.25).....	30.62%
Total phosphorus .....	.67%
Total sulphur .....	.38%
Total ash	2.34%
Total sugars	14.05%
Total dextrose	11.70%
Total sucrose	3.35%
Total ether extract	15.22%
Iodine number of ether extract.....	12.51%

At least a dozen tables would be necessary to give all of the data that were secured in the analysis of the larval food, but only a mere summary of all of these tables and data can be given here.

The protein consisted of 76.37% of non-basal nitrogen, of which 59.49% was amino nitrogen, 5.16% ammonia nitrogen, and 3.23% melanin nitrogen. The basal nitrogen constituted 14.23% of which 9.51% was basal amino nitrogen, 1.74% histidine nitrogen, 4.41% lysine nitrogen, 3.28% cystine nitrogen and 4.77% arginine nitrogen. The material was fairly rich in basic nitrogen, and unusually rich in cystine. It also contained tryptophane and tryrosine.

Boiling it all down, we have three constituents to consider, viz., proteins, sugars, and fats. These three constituents of larval food determine its nutritive value. Probably the greatest factor of all is the high protein content. Few foods are so high in protein; and the form in which the protein exists, would allow us to conclude that the great nutritive value of larval food lies in its high protein content. The high sugar content gives to the larva a readily available source of energy. It should be noted that the sugars exist chiefly as dextrose. The ash content is not abnormally high, which brushes aside the belief that has existed in the past, that bees need a large quantity of mineral matter in feeding their young. It is clear that the protein and fat are derived from the pollen, and sugars from honey. The ash is derived probably jointly from pollen and honey. However, it is fair to suppose that a portion of the sugars is



View of the apiary at University of Wisconsin, where Mr. Aepler made his experiments on royal jelly.

obtained from pollen, inasmuch as the analysis of pollen shows the presence of sugar.

Some Deductions.

While the chemical analysis of larval food presents many new things to the beekeeper I feel that it presents the most to the queen-breeder. We know that the feeding period of the queen larvae is about 5½ days, or about 132 hours. All that any bee, queen, drone or worker, will deliver in terms of efficiency, is determined during the larval feeding period. For every hour less than 132 hours that a queen-larva is not fed on an excessive amount of larval food, at least 1% should be deducted in terms of decreased efficiency.

Vitamines in Honey.

At the suggestion of one of the professors I carried on some feeding experiments to determine, if possible, if larval food is rich in either fat-soluble "A" or water soluble "B" vitamins, since this might throw a great deal of light on the subject of the great feeding value of larval food.

Young rats were fed on purified food-stuffs that were lacking in one of the vitamins. The rats were kept on such a ration until they were in a sensitized condition, that is, until they were in such a condition that they would respond very quickly to the addition of this accessory.

Two young rats were fed on a complete ration, except that it lacked the fat-soluble "A," tho it was rich in water soluble "B," owing to the presence of 10 grams of wheat embryo. The ration fed was as follows:

RATION PERIOD 1.		PERIOD 2.
	Grams	10% of larval food replaced an equivalent amount of dextrin.
Casein	18.0	
Agar	2.0	
Salt	3.7	
Dextrin	76.3	
Part of the dextrin carried the alcoholic extract of 10 grams of wheat embryo.		

The larval food was given at the beginning of the second period. During the first week, the young rats made a slight gain in weight. However, during the second week they lost in weight. At the end of three weeks rat No. 2 ate rat No. 1 and during the fourth week showed a slight increase in weight, but did not grow as a normal rat should. From this it is evident that the fat soluble vitamine "A" is either lacking, or is present in only small amounts in larval food. However, it is highly probable that it is present in sufficient amounts to promote the natural growth of bee larvae, since all experiments that have been conducted seem to prove that the two vitamins mentioned are necessary for the normal development of all animal life.

Another lot of young rats were at the same time fed on another complete diet, except that the ration lacked the water soluble "B" vitamine. The ration fed was as follows:

RATION PERIOD 1.		PERIOD 2.
	Grams	10% of larval food replaced an equivalent amount of dextrin.
Casein	18.0	
Agar	2.0	
Salt	3.7	
Dextrin	71.3	
Butter fat	5.0	

The composition of the salt mixture used in the above ration and also in the previous ration was as follows:

	Grams
Sodium chloride	0.173
Magnesium sulphate	0.266
Sodium hydrogen phosphate	0.347
Potassium hydrogen phosphate	0.954
Calcium hydrogen phosphate	0.540
Iron citrate	0.118
Calcium lactate	1.300

This mixture would supply a normal amount of mineral matter in each instance, allowing no argument that lack of growth was due to lack of mineral matter.

When the young rats were in a sensitized condition, 10% of larval food was added to the ration, replacing an equivalent amount of dextrin.

The animals immediately began to grow again and take on weight. In every way they grew as a normal rat should. It is clearly evident that larval food contains considerable quantities of water soluble "B," enough to promote the normal growth of rats.

Larval food might be considered an end product of pollen and honey. Inasmuch as no fat soluble "A" is present in larval food to an extent sufficient to promote the normal growth of rats, it is fair and logical to believe that this accessory is not found in large quantities in honey. However, it is fair to assume that it is present in minute quantities—enough to promote the normal growth of the larvae.

In recent experiments, Professor P. B. Hawk of Jefferson Medical College, Philadelphia, proves that water soluble "B" is present in honey in only minute quantities, so that he was unable to secure the normal growth of rats when extracted honey was added to the ration. Therefore, it is fair to assume that the abundance of water soluble "B" in larval food, is derived at least largely from pollen. This corresponds with the statement I made in "The Beekeepers' Item" in 1918. Professor Hawk shows that fat-soluble "A" is present in comb honey.

Does this mean that extracted honey is not a good food? Certainly not. Extracted honey always was and always will be a good food. As a readily available source of energy, few foods can compare with it. Merely because it does not contain an appreciable amount of vitamins, it cannot be discounted as a food. What it lacks in this, it makes up for in its availability as a food. Beekeepers, as a whole, will get the farthest by sticking to facts. There is no need of making vitamins a talking point in advertising honey, but talk palatability.

Oconomowoc, Wis.



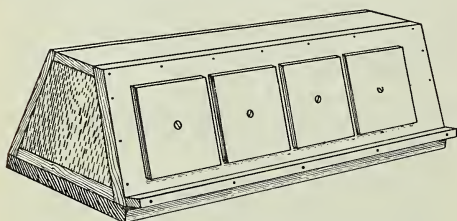
ANOTHER FOUNDATION FASTENER

Revolving Box Passes Work from Person Who Folds to One Who Fastens Foundation

Verily there is nothing new under the sun, especially in apiculture. About eight years ago I built a foundation-fastener similar to the one described in the December issue. It was surely rapid compared with the old way of fastening foundation, but I thought it somewhat cumbersome; so I built another along similar lines and thought I had improved on the old one.

This consists of a box 6 x 20 inches, with the top narrower than the bottom, thus making the sides sloping. Two sets of blocks are fastened on these sloping slides. It is not necessary to have these blocks slide up and down, since the foundation sits nearly perpendicular. This box has a 1-inch hole bored in the center of the bottom and pivots on a peg fastened in the center of a board 12 by 24 inches.

The illustration printed below does not show the pivoting device.



Mr. Williams' revolving foundation-fastener.

To operate, place the apparatus in the center of a small table. Pile the sheets of foundation on top of the box. Take a chair at one side of table, with a stove for your hot-plate paddles at your right.

Give your assistant a seat on the opposite side of the table with a box of sections, empty section-holders and supers handy. Your assistant folds four sections, places them over the blocks and then slips a holder over them. Now swing the box around so these sections are on your side, drop in the sheets of foundation and fasten them with the hot metal paddles. By this time your helper has the opposite side of the box ready with holder and sections. Reverse the box again, and while your helper folds four sections, the foundation cools enough for the holder of sections to be lifted off and placed in the super. Now keep busy. Don't visit and don't quarrel, and it will be necessary to call in more help to carry away the filled supers and bring you supplies.

Attica, Ohio.

R. J. Williams.

SPACES IN THE HIVE

Allen Latham Prefers the Bee Space Below the Frames Instead of Above Them

On page 76 of February (1921) *Gleanings* appears one of the best articles that we readers have been favored with for some time. Every honey producer had best read it, and can make no mistake to read it the second time. Some of us may differ from Mr. Pettit as to how we shall carry out the principles involved, but we must agree with him in his statements of those principles.

I shall choose for my text a sentence found on page 77 in the first column, near the bottom. "This leaves a full bee-space under the frames."

One of the amazing things in scientific apiculture which a student of this science runs up against is the frequency with which the manufacturer or fate has fastened standard misfits upon us. I will not enumerate here the numerous weaknesses of the factory hive, or so-called standard hive, but will select only one weakness and that one the position of the bee-space between bodies and supers.

In my effort to find out why this space was placed above the frames and above the sections I have come to the conclusion that it must have got there thru the notion that the cover should come down flat against the hive walls. Instead of looking ahead and considering the inconveniences which would result if the space were put above rather than below, the early hive-makers saw only the disadvantage of setting on that cover. How simple it would have been if they had seen the advantages of the lower position of the space and had contrived some way of offsetting the difficulty if it were placed above! A little thought would have arrived at a simple solution.

I will now enumerate the disadvantages of having the space above the frames rather than below. First, in manipulating the hives one must always have some empty body or open-topped box upon which to place each super he lifts from a hive. If he does not he will crush many bees. He cannot set it down upon the neighboring hive. (Right here it will occur to many of my readers that a particular form of cover was the outcome of this difficulty. This cover met the needs, but the cover itself has so many disadvantages that the remedy was costly.) Second, when the supers are placed in the wagon or auto disaster is frequent. A burr-comb on the bottom of a frame causes the bottom-bar to be pushed up so that the comb above is slightly crushed, and leakage occurs. Often, too, a bottom-bar is bowed down-

FROM THE FIELD OF EXPERIENCE

ward, and this again causes leakage. When the supers reach the shop or honey-room more leakage occurs. Follow those supers wherever they go and you will find much leakage. One must always furnish a rim of some sort upon which to place the bottom super, or else get floors of car and room sticky with honey.

Compared with the inconvenience of the bee-space above, consider that super with the space below. This super can always be set on the auto floor or upon the shop floor without first setting a something else upon which to place it. Even if there are lumps of comb upon the bottom-bars, or even if those bars are warped, they will not go below the bottom edge of the super. Leakage will occur only when the super is placed upon some loose small object like a chip, a butternut, or a nut from the auto. If one keeps floors free from loose objects, there is no likelihood of leakage when the bee-space is below the frames.

The comb-honey super also is much better with the space below. When set down on any but a flat surface with the space above, there is much likelihood of pushing the sections up and causing some of them to get jammed. The great advantage, however, is the tin-rest in the case of the bottom-spacing. Who can think of a poorer contrivance than the tin strip tacked to the bottom edges of the ends of the comb-honey super? These tins prevent a close fit of one super upon another, and they are the worst invitation for the deposition of propolis that man ever devised. When the space is below, a very narrow saw-kerf can be made about 15/64 of an inch from the bottom of the super edge and the tin-rest slipped into this. It is an arrangement infinitely superior to that in vogue.

All inner covers should be made with bee-space on either side. The double strip, that is, strip on either edge, greatly reinforces the cover and prevents to a large extent warping and twisting. It can be placed either side down, and is convenient when one wishes to present a clean surface to the bees. It also is better when the escape-board is inserted, for there is no chance that the hole be blocked by bottom-bars or top-bars.

I made my first hives with spaces above. I knew no better. As I learned better I adopted the other arrangement, making the top of the hive flush with the top-bars, and allowing the space below. I have now used this arrangement for 19 years and could not be hired to change.

Whenever I buy hives which I do not wish to sell again, I at once convert them to my arrangement. This is done very easily. The tin frame rest is removed. A strip of wood is inserted and the tin replaced. It is a simple thing if you have only

a few hives, but to do it to 500 hives and the accompanying supers would mean some task. It is too bad the mistake was ever made in the first place.

Hard as that task would be, I verily believe that I should perform it if it came my way. I surely would do so rather than be put to the inconveniences incident to a bee-space above the frames. No reform can be brought about without some loss, and usually much labor.

Allen Latham.

Norwichtown, Conn.

SAVES FEEDING IN THE SPRING

Five or Ten Acres of Yellow Biennial Sweet Clover Will Do This

Every beekeeper should have at least five to ten acres or more of this variety to build up brood-rearing early in the season for the honey flow from alfalfa and other clovers. It blooms so much earlier that a beekeeper can afford to pay \$5.00 to \$10.00 per acre for the land, for it will keep 100 colonies or more from starving, and it is much better than to have to feed, besides being cheaper.

Afalfa often fails to give any nectar the first blooming, but I have not had the yellow sweet clover fail in 20 years. Alfalfa failed to secrete any nectar in my locality the entire season of 1921; but I had 50 acres of the yellow sweet clover and about the same amount of the white, and my 100 colonies gave me a good surplus, some colonies filling five shallow extracting supers. In addition to the honey I secured a good crop of seed that I am selling at \$6 per bushel.

In the 20 years or more that I have been raising the yellow sweet clover I have not had a failure in a honey crop; besides, it has built up the land greatly. It is far better for hay than the white, being much more easily cured.

R. L. Snodgrass.

Augusta, Kan.

PROFIT IN BACKLOT BEEKEEPING

Began When 56 Years Old and Has Got a Lot Out of It

I am sending you two photos of my backyard apiary, taken in summer while the crop was on, and in the winter after the hives were packed. The photos might be of some use to you to show to other backlotters (beginners) what an ordinary backlotter with a few colonies of bees will do in the way of making money, and the other benefits he derives in the way of exercise and pleasure.

I started this little plant just four seasons ago, by purchasing for \$3.75 two colonies of bees in old hives and transferring to new 10-frame hives. Since then I have each

FROM THE FIELD OF EXPERIENCE



Mr. Coolidge's backlot apiary in summer.

season added to it until I now have 20 colonies. When I started to buy bees I made up my mind to buy cheap, for I was afraid they would all fly away and leave me with the bag to hold. I now have 20 good colonies in 10-frame hives, 50 large supers all filled with good combs, one new Root-Cowan extractor, one 60-gallon and one 25-gallon honey-tanks, one hot-water uncapping tank, queen-excluders, bee-escapes, knife, and all the other necessary articles that go with the business; also 10 winter cases, that are taken down and interchangeable, and can be packed away in the summer.

Now I don't care to set any value on this outfit, but what I want to show is that it is all profit. The bees are the owners, it's theirs, they made it. I keep an expense and receipt account for them. The bees produced honey that I sold for \$836.10; the cash paid out for the entire apiary and outfit was \$283.14, making for me a profit of

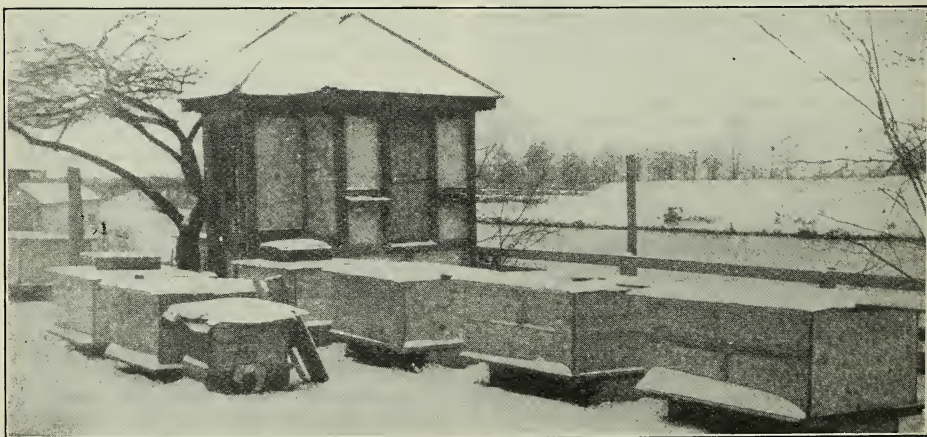
\$552.96. The apiary is worth—what? Its net profit is—. The balance I leave to the backlotter to solve.

Now that's the money part; but say, I had the bee-fever right and that was worth all I paid out for the bees. I still have it, but I am more careful not to show the symptoms so strongly. I have gotten acquainted with lots of fellows that I would not have known if it had not been for the bees. The time surely does pass away quickly when two fellows get to talking beedom. I have missed some meals. My wife says I don't know enough to come home.

I am not very old, only 60, and what I knew about bees four years ago would make you laugh; but that's another story. All I want to say is, any person that will get a little bee-sense and a couple of colonies can have a hundred or two hundred pounds of honey each year. It's fun worth while. Try it.

Troy, Ohio.

Chas. S. Coolidge.



Mr. Coolidge's backlot apiary in winter.

THE evolution of the perfect brood-comb, by H. H. Root, commencing on page 79, February Gleanings, is what I have been looking for for many months, and is of great value. Tracing the various efforts that have been made by various persons to secure the perfect foundation for a perfect comb during the past 50 years, he gives a very complete history, in brief, of the whole subject. The candor and conservatism of this article lead us to believe that the merits of the "wood-base foundation" have not been overdrawn. The next question we ask is, "Can this wood-base foundation be manufactured at a cost that beekeepers can afford to use it in place of that now in use?"

* * *

On page 83, J. L. Byer speaks of the many kinds of pests "that afflict almost all kinds of rural industries," so that it requires "eternal vigilance" to keep one from going under. He is quite right. The potato has its beetles and blights; the apple tree has, it is said, more than 150 enemies; the plum, its curculio; wheat, its blight; the cotton, its boll weevil; domestic animals, their diseases; bees, foul brood; and so on to the end of the chapter. Besides insects and blights, bacteria and microbes, there are storms and tempests, floods and drouths, and sometimes earthquakes thrown in for good measure. Surely it looks as tho there was some malign spirit abroad in the earth, with power to make all the trouble possible for us mortals. But it is not so. These difficulties are for our good, and our efforts to overcome them have helped to make the rural population of America the most intelligent and enterprising in the world. Take the boll weevil that has invaded the South and within a comparatively few years was thought to be a national calamity; it is now, if I am correctly informed, considered a blessing instead. It has in much of the Southland revolutionized farm life, compelling the cultivating of a large number of crops in the place of cotton, requiring greater intelligence and in the end producing greater comfort and wealth.

* * *

The beekeepers of the country owe a debt of gratitude to Arthur C. Miller for his painstaking experiments in curing European foul brood, as given on pages 86 and 87. I believe any one who has had much experience with this kind of disease will be ready to admit that there is a virulent type of European foul brood that does not readily give way to the dequeening and Italianizing method of treatment. It is simple, inexpensive and appears to be practical. This type

SIFTINGS

J. E. Crane

Miller recognizes it as a distinct type.

* * *

E. F. Atwater, on page 85, discusses the advisability of removing the old bees from a colony before winter. Well, is it desirable? We know a strong colony will winter more successfully than a small one; and yet, if we put two strong colonies together in the fall, we do not feel at all sure that the double colony will be any stronger the next June than either one would have been if wintered separately. During the fore part of winter the old bees will help keep the colony warm and in fact all winter, if the hive is well protected, but they drop out very quickly when they begin to fly in spring. This should be the rule; but those old bees are more restless than the younger bees and may (and, I believe, often do) set up a restless condition in the colony, so that the colony is worn out before spring. So we may have two colonies side by side equally strong in the fall, and find one wintering well and the other very badly. Let us have young bees for winter if we can.

* * *

On page 75 is a short editorial on the Government Bulletin 998 that merits every beekeeper's attention, as it relates to the energy produced by bees under different conditions, and the tremendous amount of energy required by bees during a good flow of honey. I used to wonder, as doubtless many others have, when we first began to read of flying machines why such high horsepower engines were required—50, 75 or 100 and over, just for one man to fly. So we may learn from the bee how much energy is required for flight, as well as the value of honey as fuel.

* * *

"From North, East, West and South," the reports are very favorable for a bumper crop for 1922. It would seem as tho conditions were more than usually favorable.

* * *

How much we are indebted to the kindly criticism of other beekeepers for our knowledge of our business! These criticisms have been like steppingstones to a broader knowledge of the science of beekeeping we might not otherwise have acquired.

* * *

Bill Mellvir may be a rustic jay, but his method of insuring his bees against freezing when his "honey crop is sold" is worthy the attention of every beekeeper; besides he is able to beat Walt Mason at his favorite trick. See Nov. and Jan. issues.

of disease has doubtless much to do with the contradictory experience of beekeepers in trying to clean up European foul brood. For one I am glad Mr.

THIS article is for the benefit of those beekeepers who have the hardihood to attempt to transplant those perennials commonly known as wives. It can be done, but the operation is attended with risk.

In the first place, unless the transplanting is done when the wife is young and not deeply rooted it is well to transplant one who has been frequently moved. Any nurseryman can tell you he moves his stock occasionally to insure a compact ball of roots which will endure transplanting without great shock.

But if for certain reasons you deem it necessary to transplant a wife who is not young, who is very deeply rooted by reason of never having been moved, then be sure to dig around her with exceeding care, take as much soil as possible, and avoid breaking the little tender roots which reach so far into the soil in every direction. Even with the greatest care there is bound to be more or less shock, and for that reason and in order to make her fit her new location some pruning will be necessary. And when you finally plant her in the new location, see that she is properly sheltered for a few days and that her new environment is as much as possible like that from which she has been taken.

THE reason I can write on this subject with so much assurance is twofold: transplanting is one of the gardening operations with which I have been quite successful, and just now I am writing from the standpoint of the perennial herself instead of from that of the man who did the transplanting. When you read the ordinary book on gardening, you read what the gardener has written from his observation and experience. Wouldn't it be more to the point if the plants could tell you how they feel about it?

When my particular gardener (husband) first broached the subject of transplanting me to California this fall—he had talked of it often before in the years gone by until I had come to regard it as “castles in Spain”—I was more or less enthusiastic about it, generally more in the morning and much less at night when I was tired. Also the Stancy Puerden part of me regarded it as a glorious new adventure, while Constance Boyden thought of the parting with old friends and giving up her old home as nothing less than a tragedy. You know everyone has that dual personality, but he may never discover to what extent unless he contemplates giving up his old home and going to live among strangers in a strange,

tho fascinating land. Then the struggle between the two personalities is enough to wear out the unfortunate individual who harbors them both.

Also it makes it so much harder when all one's friends are ranged on the side of the personality who fights transplanting. We know there are just as fine people in California as in Ohio—we have met some of them already and have received welcoming letters from many more—and yet, when you have lived in the same small town all your life, when you have scores of friends who call you by your first name, you feel deep in your heart that no new friends can ever fill their places.

There is one phase of leaving the old home town which is both a great pleasure and a pain. It is this:—you never realize how much your friends think of your family and yourself until you contemplate leaving them in this way. It is heartbreaking to have so many call and try to express how much grief they feel at the separation; to meet people who, you supposed, regarded your family as mere pleasant acquaintances and find that they seem to feel the separation as a keen, personal loss; to have people call for the first time in years to express their regret. And it is almost equally hard to have your friends, when they recognize that the step is inevitable, try to talk cheerfully about it, talk of the wonderful business opportunity and promise to visit you when their children are all educated.

But it is a great pleasure to listen to the very kind words which are spoken of your husband, your sons and your daughter. You know we mothers all secretly feel that our families are a little exceptional, but we never realize to what extent our neighbors and friends share this feeling until we plan to leave them permanently. If you don't believe me, just try moving away from your home town and you will hear your family eulogized until you feel sinfully proud. Undoubtedly it is true “that a prophet hath no honor in his own country,” but if he announced that he was leaving that country permanently honors would be heaped upon him.

As to leaving brothers and sisters, those by birth and those acquired by marriage, and nephews and nieces, no words can express the pain of the parting. It is especially hard when one has lived in a neighborhood surrounded by a large number of relatives. There is where the roots of the perennials become entwined with the roots of other perennials, with the result that transplanting breaks the tender roots not only of the plants which are moved but of

NOTES ON TRANSPLANTING

CONSTANCE ROOT BOYDEN
(Stancy Puerden)

these which are left. Indeed, the roots of two of the perennials in Rootville were so closely entwined that it was deemed best not to try to separate them, and therefore both were moved to California at the same time. Those perennials were my sister and myself, who have such similar tastes that we married brothers and have lived side by side practically all our married lives. I suspect our gardeners knew it would be extremely risky to attempt to separate the two families.

IN the case of perennials, not young, which I have never been moved, it is a shock from which it is hard to recover when the home is sold. The house is not the home, and yet, when the house was planned and built by your husband and yourself at the time you were married, more than 23 years ago, when your three children were born in it, when you have remodeled and improved it from time to time, when you have planted shrubbery and flowers around it, you love every stick and stone in it, and the dismantling and giving up possession is a keen sorrow.

In our own case it seemed to me that in those last few weeks I could read in the dear old house a chronicle of the love and thoughtfulness of my husband and children. At one time we removed a partition to make a large living room with fireplace where we loved to gather as a family. At another time a large sleeping porch, with three sides all wide, canvas windows, had been built to insure an abundance of fresh air and coolness for me at a time when I was out of health. Underneath the sleeping porch was a greenhouse or sunroom where I could coax a bit of spring into an Ohio winter.

The kitchen floor is covered with inlaid linoleum, firmly cemented all over the floor by the head of the house himself because the so-called "experts" would not do it according to the homemaker's ideas. Incidentally that floor was a joy to take care of. It never bulged and cracked nor shrank from the wall, and an occasional waxing made it easy to keep clean.

Adjoining the kitchen was the little breakfast alcove, designed to save the homemaker's steps, and underneath the edge of the gas range was the convenient dust chute, the description of which in these pages brought so many letters from interested readers.

A part of the house at which the head of the family felt much regret at leaving was the large attic den, lined with bookshelves and containing an office desk and convenient cupboards for a large stamp collection. There was also a pool table, for the den was originally designed as a room for the two boys of the family. When one of the boys went to college and the other boy rode his wireless hobby in the basement at all

times and seasons, the den was left to dad and he made good use of it. I am inclined to think all men like one room in a house which has not a feminine touch about it. And I suspect the young wireless enthusiast felt an equal amount of regret at dismantling his apparatus in the basement. You see attics and basements do not seem to be popular in California.

TO return to the subject of transplanting perennials:—When our gardeners accomplished the feat of getting us to California they deemed it best not to try to set us out in permanent locations immediately and so secured one large pot into which they carefully placed us both, settling all the little roots, firming down the soil and watering plentifully. It was a wise precaution, for no sooner were those plants in the pot than the mercury began to slip down in the thermometer until that California thermometer looked so much like one in Ohio that you never could have told the difference. I believe it slipped clear down to 20° above zero in our vicinity, altho I am not sure it is good form for a Californian to mention it in writing to people who are still in the East. If you know anything about transplanting perennials, you know that even the hardy varieties will not stand freezing very well immediately after transplanting. However, thanks to the precautions of our gardeners we have stood it very well, even if we did droop a little for a few days.

But that weather really was very unusual. There, didn't I say that just like a Californian of two years instead of two weeks? I have also learned to say "another perfect day" and "this is real California weather." But this cold weather was extremely unusual, for I believe no colder has been recorded by the weather bureau in this region, with one exception. And it froze so many nights in succession. Being accustomed to the cold out of doors in winter we should not have minded it except for our sympathy for the citrus growers and our sorrow at the temporary blighting of so much beauty; but when the gas pressure went lower and lower until it reached the vanishing point and the temperature of that "furnace-heated" house went down with it, our spirits followed.

But sunshine always returns in California, and we soon found we could keep fairly comfortable by staying on the sunny side of the house. In our rides with real estate agents to look up permanent homes, my sister and I have tried to impress it upon them that we must have houses every room of which has either a southern or eastern exposure, the former for the sunshine and the latter for the views of the mountains. We haven't found them as yet. A north room in California is an abomination, at least at this time of year. Why is the

(Continued on page 185.)

NEARLY every body enjoys the ancient tales of Greek and Roman mythology, born in the dim far-away childhood of the world, when dreaming wondering folk tried to account for the things around them, and tried to shape into something comprehensible their own groping and indistinct ideas of God's eternal forces, each one of which they considered a separate god. There is something majestic in their conception of Saturn (Time), the first and oldest of the ruling gods, as being the son of Coelus (Heaven) and Terra (Earth).

The story has it that Saturn overthrew his father, and was allowed by his brothers to be sole ruler of earth, on condition that he rear no male heirs. So one by one, as they were born, he devoured them—as Time still destroys what it produces. But Rhea, his wife, succeeded in saving three of the boy babies, Jupiter, Neptune and Pluto, giving their father Saturn large stones, which he unsuspectingly devoured instead. Later, Jupiter overthrew Saturn and became himself the supreme deity.

Where do the bees come into this story? Right at the birth of Jupiter. For his mother Rhea sought a cavern on the island of Crete at the time of his birth; the nymphs held him in their arms; one of them rocked him in a golden cradle; the Cretan priests, dancing around him, clashed arms and cymbals to prevent Saturn from hearing his cries. And the wild bees, guided by these clashing cymbals, hastened to the cave, to deposit their honey on his lips! Amalthea, the beautiful snow-white goat, put her two young ones aside to give "heaven's infant king" her milk. Thus milk and honey, so loved by all Oriental poets as symbols of peace and plenty, became the regular food of the infant Jupiter. Perhaps it was this habit, formed so early, that caused them later to be introduced, refined into ambrosia, the extract of purest milk, and nectar, the quintessence of honey, as the food of the gods themselves.

It was while Jupiter was still on the Cretan island, fed by the wild bees and nurtured by the snow-white goat, that one day in his play he accidentally broke off one of Amalthea's horns. At first it was made into a primitive drinking cup, but later Jupiter decreed that it should always be full to overflowing with whatever its possessor should desire—and so came the horn of plenty—the *cornu copiae*.

In recognition of their services and in deep gratitude, Jupiter, after he became king of all the gods, placed Amalthea and her two young ones in the sky as a constel-

Beekkeeping as a Side Line

Grace Allen

lation, and to the bees he gave such remarkable gifts that even to this day people say of them, "What marvelous creatures they are! I wonder how they can

do all these things!" The story-tellers of old answered that Jupiter gave the bees these great gifts in return for their care of him in Diete's cave, when they came so promptly at the call of the clashing cymbals of the dancing priests.

That is one of the most ancient of those old tales. Here is another later one. But no, let us lead up to this one the way Virgil did. First he tells his readers how to restock their beeyards, if by ill chance they should lose all their bees at once.

"But if thy whole swarm at a stroke should fail
With no stock left for breeding, let my song
Tell now a memorable art derived
From an Arcadian king, and show what way
When bulls are slaughtered oftentimes their blood
Out of corruption generates the bee.
From ancient lore I will the tale unfold."

Remember it was nearly two thousand years ago that Virgil wrote this, unfolding his tale from what was even then ancient lore. He assures his readers, too, in passing, that in Egypt "their opulent ease depends upon this art."

Then he outlines the details of this truly marvelous system. First, he says, they build a narrow sort of building, roof it with tile and make the walls straight.

"They cut four windows open to four winds,
But not square to the sun. Then from the herd
They take a steer, a two-year-old, whose horns
Just curl upon his brow."

They kill this steer, most cruelly—may I not spare you the details?

"The body then
Is laid in the enclosure; under it
They scatter boughs, the fragrant leaves of thyme
And cassia freshly pulled. This must be done
When first the Spring winds set the waters free,
Before the meadows blush with early flowers
Or ere the chattering swallow hangs her nest
Under the roof-tree beam. Soon waxing warm
The moisture rises in the softened bones,
And living creatures, wonderful to see,
Come forth, at first all footless, but ere long
With whir of wings the restless multitude
In swelling numbers on the liquid air
Bursts swift away."

Then he traces his system back to its origin, thus:

"What god, O Muses, labored to devise
This art for us, or how did human skill
Unto such novel venture find a way?
The shepherd Aristaeus"

And he is off, fairly launched on our other old story.

The shepherd Aristaeus was the son of Apollo and the nymph Cyrene. He was brought up by the Seasons, who fed him on nectar and ambrosia, so making him immortal. The nymphs taught him how to cultivate olives—and bees. But when he had

grown into quite a young man there came a year when all his bees died. Other troubles, too, came upon him. So one day he stood by the side of the river, "all tears—making hard complaint and bitter cry" to his sea-nymph mother. One wishes the nymphs had taught him to be more manly! (Yet after all, making hard complaint and bitter cry, and asking to be helped out of trouble is still a common human custom.)

Well, in this story, the nymphs were down in their chambers below the waves, sitting in a circle on their crystal thrones, spinning rare fleeces on their looms and listening to one of their number tell beautiful astonishing tales of the love and adventures of the gods. They heard the cry of the discouraged youth above, and one of them rose swiftly to the surface of the water to listen. "Sister," she called down, in effect, "Do help your boy, somehow." Cyrene then gave orders that he be admitted to this abode of the nymphs and that "the opening river floods should yield free path to the young shepherd's feet. And lo! the waves rose like a hilltop round him" and he passed down into his goddess mother's realm within the river's deeps. There he was in the midst of great wonders, at the very place where the rivers rise that sweep "thru rich farms to meet the purple sea." Nymphs brought water and napkins for his hand-washing, "piled the board with feasting and with wine-cups oft refilled—the sacred altars blazed with fragrant fires." And at last his mother told him to go for advice to Proteus, the old sea-deity, whose prophetic soul "has vision clear of all that is and was and soon will be." She warned him, tho, he must use violence, and not be dismayed by the changing shapes of Proteus. "No precept will he give save on compulsion," she told him.

In a cavern by the sea Aristaeus found him, the hoary old sea-god who shepherded the seals. He "rushed in upon him with a mighty cry and bound him as he lay." The struggling god "changed himself into all wondrous things; to flames of fire, to frightful monsters and swift-passing streams." But Aristaeus would not let him go. (Remember "I will not let thee go until thou bless me"?) Finally Proteus yielded; and he told the shepherd that it was Orpheus who had sent these troubles upon him, to avenge the death of his wife. Which leads us straight into still another story.

Orpheus, son of Apollo and the muse Caliope, was a poet and philosopher, and even more a musician. From Apollo he had received a lyre of seven strings, to which he had added two more strings, thus increasing forever the music of the earth. Orpheus had wed Eurydice, one of the forest nymphs. But one fatal day, our young bee-keeping shepherd Aristaeus, attracted by the surpassing beauty of Eurydice, had pursued her, and as she fled him in terror, she

was bitten by a serpent, and died. "The forest nymphs, her lovely peers, to the high hilltops sent their wailing cry." And poor desolate Orpheus took his lyre and went right down into the lower regions after her. There with the charm of his music he captivated everybody and everything. Instruments of torture stopped their turning, the guards were softened and even the rulers of the place became "loving and pitiful." Permission was granted for Eurydice's return—but on this condition. Orpheus must go ahead and must not once, until they were wholly back in the sunlit places, look back at Eurydice, who was to follow at a distance. Back the long perilous way he went in safety, but just as the first ray of light touched them, "ere he knew, a sudden madness seized the lover's mind—a fault to be forgiven, could hell forgive," and in his great anxiety to know if she were really coming, he sent one swift glance back at the beloved. Instantly loud thunder sounded three times, and Eurydice was snatched back—irrevocably—to the regions of darkness and desolation. "Farewell," she cried, "no longer thine, alas! but lifting thee my helpless hands." And up and down the land went Orpheus, "beneath the windy crags and by the shores," lamenting his loss in music "that made tigers tame and lured the rugged oaks to follow."

Because in these sad-singing wanderings he was ever true to Eurydice, "his faithful grief angered those Thracian maids whose kiss he scorned," and in a drunken orgy they killed him. But his voice with its last disembodied breath still cried "Eurydice!"

It was this broken-hearted Orpheus, then, aided by the bereaved sister-nymphs, who had brought the avenging troubles upon the shepherd Aristaeus. So his mother, when "Proteus' tale had end and with a leap he plunged him in the sea," advised her son to make sacrifice to appease all those offended ones; to take "four noble bulls surpassing large and strong, and with them take as many heifers fair"; to build "four altars at the wood nymphs' favored shrine"; to slaughter the victims; "but leave behind their bodies in the leafy grove"; in nine days to come back. He did all that his mother said, built four altars and on them sacrificed the four noble bulls and the four unyoked heifers. Afterward, "when the ninth morn had risen," he retraced

"His footsteps to the grove. There suddenly Men saw a wonder passing strange: the sides Of the slain cattle, now turned soft, buzzed loud With swarming bees; the belly and the ribs Were teeming; and the bees in formless clouds Streamed upward to a tree-top, and hung down In pointed cluster from the swinging bough."

Thus was the "memorable art derived from an Arcadian king," showing how "if thy whole swarm at a stroke should fail, with no stock left for breeding," "the blood of slaughtered bulls out of corruption generates the bee."



FROM NORTH, EAST, WEST AND SOUTH



In Northern California.—January was cold, especially the latter part of the month. Enough rain has fallen to take care of the needs of plant life. In the extreme northern portion of our section, rainfall is still below normal; but, as we reach the central portion of the state, we find that the normal amount has already fallen. On the whole, bees left their hives but little during the month, and consequently the consumption of stores during this period was but little. The last few days of January were extremely cold and nearly all portions of our district, including the valleys as well as the coast sections, were visited with snow. Altho practically our entire sage belt was covered with this blanket of snow, there need be no alarm concerning injury of this year's growth. The new shoots will withstand several inches of snow, and no setback need be feared. The manzanita buds look fine, and there will be an unusually heavy bloom during February.

The California State Beekeepers' Association will hold their annual meeting at Visalia on Feb. 8, 9 and 10. Unfortunately the convention will be over when these lines are read. It is our sincere hope that many will be in attendance, for under the untiring leadership of the Association's president, Mr. Cary W. Hartman, the meeting is certain of success. It need only be mentioned that the Association has been responsible for an executive proclamation, to the effect that the week of Feb. 6-11 has been designated as "Honey Week" in California. We remember very well California's honey week of a year ago, when many, many people in the city of Oakland wanted to buy honey but could not get it. Many restaurants and groceries did not carry honey, and those that did have it on the shelf carried but little so that their supply was soon exhausted. Can you imagine that not a few concerns were at a loss to know where they could purchase honey? What a state of affairs! Several carloads of honey in small package form could have been used to advantage in Oakland alone. What a wonderful thing is advertising! Our product lends itself readily to the advertiser, and the possibilities in this direction are immense. We need but to press the button, as it were, and there would be created a most active demand. The real problem of the future should be that of production.

In order to assist yourself and your industry, it is well to become a member of the California State Beekeepers' Association. This organization is very much alive. L. W. Lasell is the secretary, and the membership dues are one dollar. The Association's place of business is located at 400 Hutchinson Building, Oakland, Calif. M. C. Richter, Big Sur, Calif.

In Southern California.—The weather the past month has been very encouraging to the beekeepers of southern California in general. It has been colder than usual but no hard winds, and, with the ground thoroly soaked, all plants are getting a good start. A hard freeze on Jan. 12 and 13 did much damage to citrus fruits over most of the country, a loss of 50 per cent being estimated in some places. Corona came thru the freeze the best, perhaps, of any locality in southern California. The probable loss here is from two to possibly ten per cent of the fruit. Corona has only a very limited number of locations for making orange honey, as over 60 per cent of the citrus acreage here is planted to lemons, which are not classed the same as oranges in honey production.

Several carloads of bees have already arrived in southern California from Utah and Idaho points. Also, two cars have been shipped into Riverside County from the Imperial Valley. This same man shipped to the Imperial Valley from Riverside County about 12 years ago. When we think of the inconsistency of some people it is no wonder that we sometimes doubt man's sincerity. It is only a short time since the beekeepers of Imperial County enforced an exclusion ordinance to such an extent that a man who had arrived with a carload of bees was compelled to reload what he had unloaded and reship out of county, to his great inconvenience, to say nothing of the loss. To give and take is the only way. Until we look upon our brother beekeeper as human and entitled to his share of the things God has put here for all of us to enjoy, we will not get from life the real blessings of living.

Much credit is due Cary W. Hartman, President of the California State Beekeepers' Association, for his untiring work in bringing the use of honey before the public. It was greatly thru his efforts that the Governor of California proclaimed Feb. 6-11 as "Honey Week." This should stimulate the industry, as all of the citizens of the state are urged to use the products of the beekeepers during that period.

Many beekeepers are still feeding sugar in considerable quantities. This shows good judgment. A colony that comes thru the winter a little stronger, by the judicious feeding of a few pounds of sugar, will be in condition to store honey or divide for increase weeks ahead of the one that just pulls thru on account of the shortage of stores. Keep a close watch on all colonies, and any that are at all short of stores should be provided for. It is too late now to let any starve out or just exist.

A few of the strongest colonies may show



FROM NORTH, EAST, WEST AND SOUTH



signs of swarming by the last of the month. To lose any of these will be a loss, indeed; for if "A swarm of bees in May is worth a ton of hay," as the old saying goes, what is it worth in March?

Early in the season we often have mornings that stay cool until well into the forenoon. This gives much time to set foundation, wire frames and do odd jobs. But he who is wise will have as much as possible of this kind of work done before the real bee-work begins.

L. L. Andrews.

Corona, Calif.

* * *

In Arizona.—The probability suggested in our last report for this department, that a large proportion of the bees in Arizona were entering the winter without adequate stores for the season, has been verified by further reports from beekeepers. The winter, especially the month of January, has been below normal in temperature, at least in southern Arizona. This has doubtless had a tendency to conserve the scanty stores up to the present.

In this month, however, in the southern region (in which are located nearly all of the apiaries of the state) may confidently be expected the beginning of spring, marked by the opening of cottonwood catkins and the blossoming of the sweet-scented leafless mistletoe on mesquite trees. The pollen available from these sources, with possibly some nectar from the mistletoe, together with the rising temperature, stimulates brood-rearing and consequent rapid consumption of stores. It therefore behooves the beekeepers of this region to examine into the condition of their colonies at this time and to feed those requiring it until nectar from outside sources is available.

The winter rains for the months of November, December and January, taken together, have been somewhat below normal, but for January alone slightly above normal at Tucson. It therefore appears probable that conditions may again be favorable for an early spring nectar flow from various wild flowers, sufficient for spring upbuilding, prior to the regular mesquite-catsclaw flow. The rainfall for February and March is, however, the determining factor for this early flow. If this occurs, feeding will be necessary for only a short period. It will be remembered by Arizona apiarists that this early spring flow was very fine in 1920, coming on strongly in March and yielding some surplus in April, but that it failed entirely in 1921. Should this flow develop well, beekeepers will need to be on guard with swarm-prevention measures against uncontrolled increase.

Chas. T. Vorhies,

Tucson, Ariz.

In Texas.—The weather in January has been extremely variable and not advantageous to the bees. The first part of the month was very warm and dry. The bees were active every day, and the amount of stores consumed was great. In many cases bees were observed carrying in supplies of pollen and nectar. It was very interesting to see the number of bees engaged in carrying water into the hives at this time of year. It is reported that there has been enough blooming along the Rio Grande to cause a considerable amount of brood-rearing and a nectar flow sufficient to warrant the queen-breeders in starting work. The latter part of the month Texas suffered from a blizzard.

The reports from various parts of the state relative to the honey plants are very contradictory. Observant beekeepers, living but a few miles apart, report very differently. Dry weather during November, December and January has very much decreased the chances for a horsemint honey flow. It seems to be the opinion of the majority of the beekeepers that we must have rain in the next month if we have anything like a normal honey flow. A number of old-time beekeepers, however, predict that we shall have a good honey flow from huajilla and mesquite, as they say that these plants always give a good surplus following a dry winter.

The Texas Honey Producers' Association held its annual meeting on Jan. 17 when the membership was well represented. A policy of retrenchment was agreed upon, and the membership in the American Honey Producers' League was continued. E. G. LeSturgeon, W. O. Victor and Miss Alma M. Hasslbauer were elected to succeed themselves as directors, and T. W. Burlison of Waxahachie was elected to fill the unexpired term of W. C. Collier, resigned. Ambrose Johnson of Laredo was elected president; E. G. LeSturgeon, manager; and Miss Alma M. Hasslbauer, secretary.

There seems to be more activity among the beekeepers than for several years. Many of the large beekeepers, who have made no increase for the past three years on account of the high price of fixtures, are now planning on increasing their number of colonies considerably. Numbers of men who own box hives will transfer this spring because of the lower price of hives. During the past four years, a great deal has been printed relative to beekeeping on the farm, and this publicity is commencing to bear fruit, as during the coming spring there will be many farmers who will install a few colonies of bees. Mr. Reppert, Extension Entomologist, A. & M. College, informs us that the bee interest is becoming very strong in the southeastern portion of the state and



FROM NORTH, EAST, WEST AND SOUTH



that much transfer work will be done this spring.

It has been mentioned several times that honeybees rarely work inside of the cotton blossom in collecting nectar. T. W. Burleson of Waxahachie reports that after the flower has wilted the bees collect a great deal of nectar from the calyx. This bears out the statement I have made a number of times that all of the nectar glands of the cotton plant are situated on the calyx or other vegetative parts of the plant. The nectaries on the inside of the calyx are protected from the bees by the corolla and can be reached only as the flower commences to dry up. This places the cotton in the class with such plants as tobacco, the Jerusalem mustard and a number of other long-tube flowers which become nectar-bearing only after the flower has withered.

This fall many beekeepers reported a large bug was killing many of their bees. An investigation showed that this insect was one variety of the stink bug, sometimes called the wheel bug. These insects are large, gray-colored bugs with long legs and a very long bill. During November and December, in many apiaries, four or five of these individuals would be seen around each hive entrance, and every one of them would have its bill inserted in a honeybee. As this bug is a native, there is little danger of its becoming a pest.

The people of Texas pride themselves upon the inability in any way to predict the weather or condition of crops. Just why this tradition has grown up is very uncertain, as the people who have come into Texas find that predictions on the weather and crops are just as reliable in Texas as in any other state and, in fact, more so. While the predictions may not come true, the beekeeper will never be at a loss if he is prepared for the predicted honey flow. In Texas, where a large per cent of the honey plants are native, there is a greater chance of regular flows than in a country where the honey flows come mostly from imported plants. The beekeeper should ascertain the time of the commencing of his main honey flows and should be ready for the flow at the earliest date upon which he has found the flowers to yield nectar. H. B. Parks.

San Antonio, Tex.

* * *

In Arkansas.—The beekeepers of Arkansas have very much to be thankful for, since we have very little foul brood in the state and have received a fairly good price for our honey for the 1921 crop. Now we have a favorable winter, having had a good snow in the northern part of the state on Jan. 26. Our winter problem is keeping the bees in the hive during the

winter months, since the colonies are in single-walled hives. The warm days cause the winter cluster to be broken. I believe we should consider the expense and the advisability of having double-walled hives in order that we may overcome this disadvantage, thereby conserving bee energy. This seesaw in temperature has a tendency to use a greater amount of stores than would be used under an even or continuous cold.

March generally is a spring month with us and we find much to do. First of all, we give each colony a thoro inspection to see if it is well supplied with honey for brood-rearing, since with us this is very important, from the fact that it is too often we have cold, wet weather when the blackberries and huckleberries are in bloom. It may interest some readers to know that we have a certain school of people keeping bees in our state who insist that we should "rob the bees" during March or the bees will carry the honey away to make room for the new crop soon to come on.

Next in importance is to see about our queens, so that we may properly care for the queenless colonies. Now that we have a new trouble looming up, we must add to our spring work a close lookout for any foul brood. Unfortunately for us, we have no laws in Arkansas for the protection of our important industry. We must watch for this disease and wipe it out, and at the first opportunity we must interest our senators and representatives to the degree that they will pass some law protecting our interests.

In several back issues of *Gleanings* I saw articles by Mr. Foster and others pertaining to the importance of some marketing system for our commodity. I believe the time is now opportune to organize producers of honey in these United States—to organize not as producers, but for the commodity, honey, in a marketing association.

Elba, Ark.

J. V. Ormond.

* * *

In Alabama.—The beekeepers of the black belt of Alabama and Mississippi are in danger of having their 1923 honey crop ruined by cold weather. All of the white sweet clover seed have sprouted in the warm weather during January, and severe cold at this time would practically destroy the crop. This is our surplus crop, and without it the bees would get scarcely enough honey to exist.

Of course there is a chance for no more severe cold this winter; and yet our worst cold weather is generally in February. We had these same conditions in 1917, which caused a big loss to the beekeepers of the South.

The low price of honey and the poor demand for queens last summer caused the



FROM NORTH, EAST, WEST AND SOUTH



bees to be put up with plenty of stores and all young queens. This should give us plenty of young bees for the early package trade.

The demand for honey for the past few months has been very slight, caused principally by the big crop of cane syrup. When the very best syrup can be bought at 50 cents per gallon retail, and honey at four times that figure, there is naturally little demand for honey. Conditions will doubtless be much better in the spring when the syrup begins to get strong. As honey retains its delicious flavor many people will use it regardless of price. J. M. Cutts.

Montgomery, Ala.

* * *

In Mississippi.—The Mississippi & Yazoo Delta Beekeepers' Association met on Jan. 12 in its second annual business meeting. The report of the secretary-treasurer showed that the Association had served a good purpose. Most of the honey crop had been sold. A dealer from a branch house of one of the well-known supply manufacturers announced that, due to the increased business done with his firm last year, he had been authorized to offer a still larger discount to the Association.

The Association passed resolutions urging the Legislature, now in session, to appropriate sufficient funds for the State Plant Board to continue its bee-disease inspection and eradication service. Altho 1921 was the first year of this work, with five men in the field during the summer, American foul brood was reduced over 84% and European foul brood over 62%. The beekeepers in the Delta section (to which section foul brood in Mississippi is confined) not only are anxious to eradicate these diseases that they may make more honey, but they are eager to eradicate them so that they may enter the nucleus and package bee business. Colonies build up strong and swarm in April in the Delta, but no honey flow comes until June. These beekeepers realize that they can sell two or three pounds of bees from each colony in April, the removal of which will stimulate their colonies to increase brood-rearing, which in turn will bring the colonies up to the honey flow in better condition than they would be were no package bees taken. The present State Plant Board regulations prevent a man from shipping bees unless his apiaries are free from foul brood diseases, as far as rigid inspection can ascertain. People buying bees from Mississippi can rest assured that they are not importing any foul brood with their purchase.

Altho the Mississippi & Yazoo Delta Beekeepers' Association is not as yet affiliated with the American Honey Producers'

League, they are interested and agreed at the meeting to hold their next meeting at the convenience of the speakers who, we expect, will tour the country this year in the interest of the League and beekeeping in general.

Apiary inspection in seven Delta counties has thrown a revealing light on census figures. According to the last census these seven counties had 1,024 colonies of bees. According to the apiary inspection service there were 2,769 colonies in these counties. Such glaring discrepancies as this should provoke all apicultural interests to such action as would secure for us a fair census report of our industry.

The census figures point out a mere 11% growth in the number of colonies kept in Mississippi during the past decade. These figures, of course, do not point out the enormous growth in commercial beekeeping during this period. In 1910 the queen, nucleus and package bee business was unknown. In 1921 over 35,000 queens were shipped from Mississippi, besides over 10,000 nuclei and pound packages. We are ideally located for the production of early bees that can be rapidly delivered to the East and Middle West. Mississippi expects to ship \$125,000 worth of bees in 1922. R. B. Willson.

Agricultural College, Miss.

* * *

In Florida.—The winters in the extreme southern part of Florida and on the Keys are much more trying on the bees, and the winter losses are much greater, on the average, than in the clover belt. This is due to the warm dry winters when every day the temperature is around 80 degrees and there are no nectar-producing plants in bloom. The bees work themselves to death in the fields and there is no brood-rearing, or so little of it that the young bees do not come on in sufficient numbers to take their places. The present winter has been an extremely trying one on account of dry weather. There has been less than an inch of rainfall from the first day of November to the first of February.

A serious winter loss is caused by the disappearance of queens at a time when drones are absent and matings can not be secured. This loss of queens is not confined to the winter months, but is distributed thruout the year. It amounts to about 25 to 30 per cent for the year. Other beekeepers with tropical beekeeping experience, with whom this trouble has been discussed, have experienced the same difficulty, but none have been able to give a satisfactory answer as to the cause. It is not from supersedure, with the young queen lost on her wedding flight, as it is the young and most prolific queens that more commonly disap-



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pear. It is not from swarming, for there are no swarming cells and the bees frequently neglect to start queen-cells until it is too late, so they become hopelessly queenless.

When the queen disappears in the winter the colony is as good as gone. If it is fairly strong in bees, it may be used to help out a weaker colony or the combs can be set over a strong colony to save them from the moths. The bees are seldom without a little brood at all times; but during December and January they attempt to take a rest and are frequently without brood, so that lack of brood and failure to discover the queen are no proofs as to queenlessness; but, if moth larvae are found present also, one may be sure the queen is gone. A hopelessly queenless colony, no matter how populous, quickly succumbs to the moth. The bees seem to lose all "pep" and do not even attempt to fight the moth. The moth larvae and queenless bees will crawl around and over one another without showing the least concern about each other.

Another special winter pest found all over Florida is an ant with the formidable name of *Camponotus abdominalis* var. *floridanus* Buckley. This ant has been quite fully discussed by the late O. O. Poppleton, and his article has been reprinted in the A B C & X Y Z. This ant is both vegetarian and carnivorous. It also loves sweets, and in the summer months it can be found feeding upon the nectar in the bloom, especially on palmetto, and also upon the tender terminal buds of plants. In the late fall and winter months there is nothing they like better than the bees, brood and honey of the hive, and they move in and take possession irrespective of the size of the colony.

If the apiaries are located in comparatively large cleared areas, they are only occasionally bothered by these ants, but when placed in small clearings in the jungle there is only one successful method of combating them. Tanglefoot they will wade thru, corrosive sublimate they enjoy, pans of oil are shortly bridged across by grass or weeds and permit the ants to reach the hives. Ditches around the yards, deep enough to contain standing water, will keep them out, as the ants will not attempt to cross water. In this part of Florida the cost of the moats is not prohibitive, as standing water can be reached at a depth of from one and a half to three feet.

To give the reader an idea of the damage these ants can do, out of 738 colonies in four yards 276 were destroyed in less than two weeks, and almost 100 of these were killed in a single night.

Key Biscayne, Fla. C. E. Bartholomew.

In North Carolina.—January, in North Carolina, marks the height of the quiescent season with bees, there being, however, but few periods of more than a few days at a time when the bees are kept continuously in on account of cold. They were bringing in pollen right up to Christmas week, and in this southeastern section, there will probably be not more than a very few weeks before they will be gathering it rapidly again, especially from mistletoe and others of the earlier flora. In fact, nectar for increased brood-rearing will be getting plentiful by the middle of February.

Information from various sections of the state indicates the continuance of a very satisfactory condition of colonies among the beekeepers generally. Furthermore, the very poor honey yield the past season seems not to have materially discouraged the beekeepers. In every quarter plans are being laid for aggressive work with the bees for the approaching season.

For two weeks very cold weather, with exceptionally heavy snow fall, has stirred the expectation that there will be a late spring, and this would mean less probability of frost to curtail or destroy the early spring flora, as was the case last April. Indeed, the prospect now is for ideal conditions for honey production hereabouts. Beekeepers, generally, were careful to see that their bees went into the winter with ample stores, feeding wherever necessary to make up any deficiencies.

The convention of the North Carolina Beekeepers' Association was held at the State College, Raleigh, Jan. 18-19. Elton Warner, Asheville, was made president; J. E. Eckert, Raleigh, secretary-treasurer. It was in many respects a most profitable convention, with practical talks on various phases of bee culture by President Warner, E. R. Root, C. L. Sams, state bee specialist, T. M. H. Lewis and others.

The Association appointed a special committee, consisting of W. J. Martin, Elton Warner and J. E. Eckert, acting in conjunction with state and federal bee specialists, to work toward the enactment of whatever additional legislation the state may need to assure the control of bee diseases, which are as yet present to a very limited extent in this state. It will be with the 1923 General Assembly, which convenes next January, that the committee will deal especially, undertaking to get together the best and most adaptable features of such laws in other states for application in North Carolina. The best time to beat bee diseases is before they get a foothold.

Wilmington, N. C.

W. J. Martin.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Honey for Automobile Radiators. Fall honey in western New York this year is considerably mixed with honeydew, and of course of low quality. We are disposing of most of ours as an anti-freeze for automobile radiators. Honey mixed half and half with water makes a solution which we have never yet known to freeze and will readily circulate in any cooling system. The boiling temperature of honey being 245 degrees and that of water 212 degrees, it makes a solution with an approximate boiling temperature of 228 degrees, or 16 degrees higher than water alone, and as the honey does not evaporate, all that is needed is to add more water from time to time as needed. We are selling this low-grade honey for this purpose at 10c per pound; and, as an ordinary Ford radiator requires about 15 lbs., it costs \$1.50 for a Ford, and more or less, as the case may be, for other cars. The men using it here say it is cheaper than wood alcohol, taking into consideration the loss of alcohol by evaporation. Besides this they are at all times sure with honey, while with alcohol they never know if they have enough of it, owing to the evaporation. Honey will not in any way injure either metal or rubber. In fact, it is a rust preventive and after being heated it holds its heat longer than water and makes starting easier in cold weather when the car is left standing for a few hours. James H. Sprout of Lockport, N. Y., was, I think, the first man to use it for this purpose. He has used it continually for at least six winters; and, if beekeepers everywhere will advertise its merits for this purpose, the demand for it will take care of all and more of the cheap grades of honey produced in this country. H. M. Myers.

Ransomville, N. Y.

Wiring Jumbo Frames. Much is being said of late about the Jumbo frame, and many will be put in use the coming year. I

I notice some firms are sending these frames out with end-bars pierced for only four wires, the same as the regular Langstroth. A great many good beekeepers have considered that four wires are scarcely enough for the regular frame, and that many sagged combs are the result even with careful and painstaking beekeepers. It seems to me, knowing these things, that it is folly even to think of getting anything but sagged combs with four wires in a Jumbo depth frame, unless some support is given the foundation other than the four horizontal wires, and I would hate to chance it then.

The past two years I have been using the "one thousand dollar trick" described in

Gleanings some time ago and am exceedingly well pleased as well as repaid for using it. I have tried it out under the most trying conditions, by hiving swarms on the foundation with a brood-comb between, also by giving all foundation excepting the outside combs. In examining these combs not a single sagged comb have I found, and they are as nearly perfect as it is possible to get them—something I was never quite sure of when the four horizontal wires were used alone. It is certainly worth trying by any beekeeper who is working for perfect combs, and really it is very little more bother. A sagged Jumbo comb is very little better, if any, than a perfect Langstroth comb; and if the results are obtained that we want and expect from making the change of hives and frames, it will be necessary to take more precaution with the wiring of Jumbo frames than the Langstroth. The diagonal wiring holds the frame perfectly square if the frame is placed in a square form before tightening the diagonal wires—another good feature. I use a small wire staple driven in the groove of the top-bar. I have never had one pull out, and the wire slides easily thru the staple when tightened.

Center Junction, Ia. W. S. Pangburn.

\$168 from Two-Pound Package the First Season.

On page 43, January issue, is a record of a two-pound package of bees that produced more than \$50.00 worth of honey the first season. This is indeed a good record; but I am in receipt of a letter from C. B. Hamilton of Michigan that a two-pound package shipped him last spring produced 577 finished sections of honey (24 cases), that sold for \$7.00 per case, or \$168.00.

I believe this to be the greatest amount of comb honey ever produced by a two-pound package in the same season that it was shipped. If anyone has done better, we should like to hear from him.

Montgomery, Ala.

J. M. Cutts.

How to Secure Surplus in Poor Seasons.

We have 20 colonies of bees, as much for pleasure as profit. We have bought queens of our leading breeders until we have bees that we are proud of. Our 1921 honey flow was the poorest for several years. We sold about 700 pounds at 20c a pound. I know of only three that got any surplus. Our hives were boiling over with bees just at the right time, which gave us our surplus. I know of one beekeeper having 28 stands who had to buy honey for his own use.

HEADS OF GRAIN FROM DIFFERENT FIELDS

I am over 70, but I have to do something and the bees fill the bill to the dot.
Blackwater, Mo. C. T. Reicker.

Why Not Omit the Alighting-Board? On page 44 of *Gleanings* for January, 1921, you quote George J. Griesenauer of Cook County, Ill., regarding the obstruction of the entrance at the alighting-board. Why not dispense with the alighting-board and the trouble along with it?

I use the $\frac{3}{8}$ -inch entrance, closing the $\frac{7}{8}$ -inch side. A discarded super, or rim, for a a hive-stand *furnishes a vertical plane surface from the ground to the entrance and is satisfactory. The bees enter as readily as with the alighting-board. Bees missing the entrance move upward readily without negotiating the under side of an alighting-board. A larger entrance is provided by raising the hive at the front on blocks on the rails of the bottom-board.

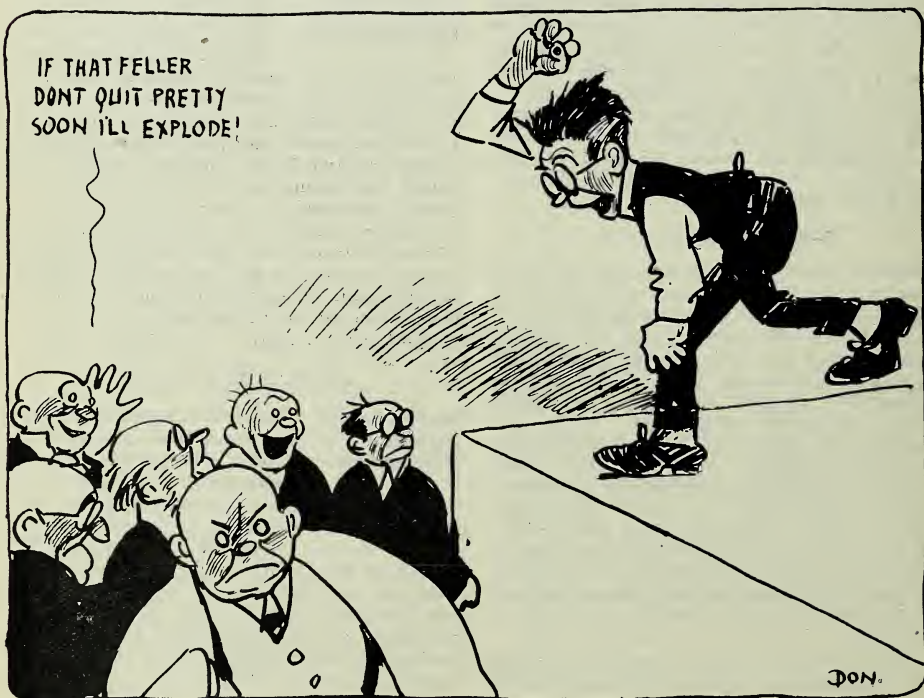
Falls Church, Va. A. M. Wheeler, Jr.

Age Brings Wisdom.—By Bill Mellvir

(With apologies to Walt Mason.)

When I was young, I'd wind my tongue, then go away and leave it. It worked by steam on any theme the natives scarce could believe it. I talked on bees in one grand wheeze to Thomas, Dick and Harry. With wisdom great I filled each skate with more than he could carry. I lectured loud to every crowd of beemen I could gather. I thundered forth great thoughts of worth till I was in a lather. Then every year my frame I'd steer straight to our bee convention to sprinkle words on wise old birds, of hives and swarm prevention. I'd criticise wise-looking guys and roast the ancient critters. Then when they'd spring some brand-new thing, I'd roll them flat as fritters. I

knew it all; with buoyant gall, the beemen I instructed; I thought they'd make a grand mistake if not by me conducted. I made a hive that ate alive the Langstroth big invention so these queer folks would eat their jokes and give me due attention. I wrote enough beekeeping stuff to fill a year of *Gleanings*, but Mr. Root said, "tho you're cute, your stuff is chaff and screenings." But now I'm old and not so bold, I'm not so sure and cocky. To wisdom's gate the road is straight but also awful rocky. Till now at last I'm learning fast—a beeman in the making. But believe me, boys, you're chiefly noise—it takes a lot of baking.



QUESTION.
—When the lime-sulphur solution is used on fruit trees for control of San Jose scale, is damage or injury therefrom likely to result to bees located in the orchard from gums or resinous substances they might gather from the trunks of the trees for propolis?

Idaho.

Lawrence O. Nichols.

Answer.—So far as known the lime-sulphur solution does not injure bees in any way. It would seem that the chances of bees being seriously injured in the manner you suggest would be very small indeed. So far as known, it is only when poison, such as arsenic in some form, is added to the spray solution that bees are injured. Even then they are seriously injured only when the spray is applied while the trees are in bloom or when the bees are working on the cover crop on which some of the poisoned plants fall.

BEES DISAPPEAR DURING WINTER.

Question.—In March last year I found all the bees gone from three hives, leaving plenty of stores. What do you suppose was the trouble with them?

North Carolina.

T. W. Gentry.

Answer.—These colonies may have been queenless last summer or fall, and having none but old bees they would, of course, die off gradually from old age until none were left. It sometimes happens when bees swarm that the young queen left in the parent colony is lost in her mating flight or fails to become fertile. When this happens the parent colony is hopelessly queenless and will die in the fall or winter if not before, unless the beekeeper supplies them with either a queen or some brood from which to rear one. Sometimes laying queens are lost, and thru some accident the colony fails to requeen itself.

The colonies may have swarmed out because of American foul brood. They often do this if the disease is permitted to run for long, even when they have plenty of honey. You can tell by looking for dead larvae and pupae in the brood-combs, and especially by looking for the dried-down scales on the lower cell wall if the colonies had American foul brood. By examining the combs carefully you can also usually tell if they were queenless the previous summer. Queenless colonies usually fill their brood-combs with pollen; so, if you find the combs heavy with pollen, you may be fairly certain that these colonies were queenless.

BEES LEAVE HIVE AND BECOME CHILLED.

Question.—What causes bees to leave their hives in a frenzied manner, take flight and drop to the ground stiffened from the cold? The bees are well packed, and the thermometer was 25° when they came out.

Ohio.

Andrew Stofka.

Answer.—Bees will fly from their hives

GLEANED BY ASKING

Geo. S. Demuth

when it is too cold for safe flight, only when in distress from age or accumulated feces. Old bees often leave the hive on bright days in winter and

quickly become chilled in the manner you describe. Since these old bees would otherwise die in the hive a little later their loss is of but little consequence. When bees are wintering on poor stores, such as some kinds of late-gathered fall honey or honeydew, they often become so laden with indigestible matter that they are in great distress and fly out in an effort to relieve themselves of accumulated feces. It sometimes happens that many bees are lost when there is snow on the ground, even when the air is warm enough for safe flight, by falling into the snow and becoming chilled before they can again take wing.

DIFFERENT SIZES OF SECTIONS.

Question.—Why are sections made in three different sizes?

W. J. Shafer.

Ohio.

Answer.—Formerly many more different sizes and styles of sections were made than at present. During the period of the development of the standard hives and equipment of today, many beekeepers used odd-sized hives and supers. In many cases these odd-sized supers called for odd-sized sections.

Just why certain sizes have become standard is an interesting story. A. I. Root made his first sections $4\frac{1}{4} \times 4\frac{1}{4}$ inches in order that eight of them would fit inside of a standard-sized Langstroth frame made of $\frac{1}{4}$ -inch stuff but wider than the brood-frames. To make these hold about a pound he made them $1\frac{1}{8}$ inches wide, with top and bottom narrower to admit the bees. Later, when the one-piece section was invented, the openings at the top and bottom were cut out of the wood to form the beeway, as they are made today. When wooden instead of tin separators came into vogue, about 1890, the width of the standard section was reduced to $1\frac{1}{8}$ inches to allow $\frac{1}{16}$ inch for the thickness of the separator. This size and style of section are still standard, more of these being used in this country than any other. When the fence separators and plain sections were introduced in 1897 the $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{2}$ -inch plain section was made to fit the same supers as the standard beeway section, these plain sections having the same comb thickness and therefore the same capacity as the standard $1\frac{1}{8}$ -inch section. The 4×5 section came into general use largely in connection with the divisible brood-chamber hives which were so vigorously exploited from 1885 to 1900, the sections taller than wide had long been in use

by extensive honey producers in New York to fit the Quinby standing frame hive. The frames in the divisible brood-chamber hives were $5\frac{3}{4}$ inches deep, which at once suggested the 5-inch section, thus making the brood-chamber parts and supers alike, except the inside fixtures.

HUBAM AS YIELDER OF NECTAR.

Question.—How many good, strong colonies will an acre of good annual sweet clover (Hubam) supply, giving them all they can do?

California.

C. H. L. Sander.

Answer.—The secretion of nectar varies so much under different weather conditions and different types of soil that it is impossible to answer this question definitely. Hubam clover is known to yield nectar freely under favorable conditions, probably about the same as the biennial varieties during the second year. No doubt, it will be found that it yields nectar more freely in some localities than in others. This is true of other plants and is to be expected in the case of Hubam. In order to yield nectar freely, plants must be growing in suitable soil and in a suitable climate. It is well known that each plant has its own peculiar requirements as to soil and climatic conditions. While sweet clover apparently thrives almost anywhere, it does best in soils which contain considerable lime. Probably an acre of Hubam clover would be sufficient for two or three colonies of bees, enabling them to store considerable surplus honey if conditions are favorable.

FEEDING FERMENTED HONEY.

Question.—I have 100 pounds of partly fermented honey. Can I use this in any way to feed the bees in the fall or spring?

P. A. Schaeffer.

Pennsylvania.

Answer.—Yes; honey that is slightly fermented can be fed in the spring after the weather is warm enough for the bees to fly freely nearly every day. Such honey should not be fed in the fall in your locality or in any locality where the bees are confined to their hives for long periods during the winter. Fermented honey can be greatly improved by heating it to drive off the alcohol. If American foul brood is in the apiary in which this sour honey was produced, it would not be safe to feed this honey without first boiling it in a closed vessel for about 30 minutes, first diluting the honey by adding about an equal volume of water.

COMB HONEY OR EXTRACTED HONEY.

Question.—I expect to engage in beekeeping, but am undecided as to whether to produce comb honey or extracted honey. Which do you advise?

Connecticut.

Lawrence W. Smith.

Answer.—Much depends upon the character of the honey flow and the quality of the honey of your locality as well as upon your market. If you sell your honey locally and can sell extracted honey readily at nearly the same price as comb honey, it will certainly be more profitable to produce extracted honey; but, if you can get twice as

much or more for comb honey, it may be more profitable to produce comb honey. But so much more skill is required to secure good yields of comb honey than of extracted honey that, even at double the price, comb honey may not be as profitable as extracted honey, on account of the smaller yield. However, if conditions are just right for comb-honey production, about three-fourths as much comb honey per colony can be secured as extracted honey. There will be more trouble from swarming when producing comb honey. In fact, many beginners not only fail to secure a crop of comb honey because of swarming but also find their colonies weakened and short of stores at the close of the season. This is especially liable to occur when the honey flow is short and comes early in the season. Of course, where the swarming problem is properly handled such loss does not occur. In those locations where the honey is white and does not granulate readily in the sections and where the honey flow is rapid, comb honey will give a larger return per colony at present wholesale prices, provided, of course, the bees are properly managed. In your particular location no doubt extracted honey will yield better returns, especially if you sell it locally.

SHALLOW EXTRACTING SUPERS.

Question.—Which is better for producing extracted honey, the shallow extracting supers or the regular depth?

Max Wenneneswer.

Texas.

Answer.—Some prefer the shallow extracting supers, but most of the extensive honey producers prefer regular depth supers. Some advantages of the regular supers are: Fewer of them are needed to hold the crop of honey, making the equipment less expensive; there are not so many combs to handle when extracting; and the combs being the same size as those in the brood-chamber, they can be interchanged when this is desirable, thus simplifying the equipment. The shallow extracting supers are lighter and easier to handle, and in locations where the honey flow is slow or where the yield is small their smaller size may be advantageous in tiering up. If the two kinds are equally well filled, 167 shallow extracting supers having frames with $\frac{3}{8}$ -inch top-bars will hold as much honey as 100 full depth supers having $\frac{1}{8}$ -inch top-bars. When purchased in the flat the 167 shallow extracting supers with frames and full sheets of foundation (same weight) cost but little more than 100 full depth supers with frames and foundation, but the labor required to put up a shallow super is nearly equal to that of putting up the full depth supers. In regions where bulk comb honey is produced extensively, as in your state, many beekeepers prefer the shallow extracting super, because it is well adapted to the production of bulk comb honey as well as extracted honey.

BEGINNERS

who have not yet secured their bees should read carefully the "Talks" in the February issue concerning the various ways of obtaining a start in bees and the things to look for in judging the value of colonies that are for sale.

In the extreme South beginners should have their colonies now. In the middle latitudes the bees should be secured before April 1, and in the far North it is well to do this before May 1. Of course, bees can be purchased and moved home any time during the spring or summer; but it is better to have possession of the colonies some time before the main honey flow (see Talks in last issue) if possible, for there is much that can be learned in handling the bees early in the spring, and proper care of the bees during the month or six weeks just preceding the honey flow is extremely important. Whether north or south the bees can be brought home at any time now. Even in the North, colonies that are in good condition now are fairly safe, so far as the winter is concerned.

To move the bees home, close the hive entrance with a piece of wire screen, so no bees can get out; and fasten the hive parts (body, cover and bottom) together by nailing on pieces of lath. The entrance should be closed when the bees are not flying either on a cool day or in the evening, so no bees will be lost, and as soon as the hive is placed in its new location the entrance should be opened.

Where to Locate the Bees.

The hives should be placed in a sheltered nook where they will not be exposed to cold winds, but they should not be in a dense shade. They should be where the sun can shine on them during most of the day, especially during the spring. If convenient, it is desirable to have the entrance of the hive toward the east, southeast or south, tho, if well protected from cold winds, this is not essential. If on sloping ground it is better to place the hives on a southern or southeastern slope if possible.

The hives should be placed upon four bricks, on blocks of wood or on a regular hive-stand made by nailing together four boards three to six inches wide, to make a rim about the size of the bottom of the hive, the four pieces standing on edge. The hive should be level from side to side, but should be about an inch higher at the back than in front.

If on a village or city lot, the bees should be located well away from the walk, preferably near a high board fence or hedge, so that the bees will go upward before fly-

ing across neighboring lots, preventing annoyance to neighbors. Where there is no suitable place in the back yard, the bees can be located in the at-

tic of the dwelling or even on the roof, if necessary. If in the attic a few auger holes will provide an entrance.

Starting With Package Bees or Nuclei.

In the North, those who expect to purchase bees in packages or nuclei from the South (see Talks in last issue), instead of established colonies, should order these now to be delivered in April, or if in the far North the first of May may be early enough. The three-pound packages usually give best results in surplus honey, tho the two-pound packages often yield as much, or more in proportion, as the larger ones. A queen must be ordered with each package, for she alone must lay the eggs that provide young bees to build two or three pounds of worker bees up to a strong colony before the main honey flow.

Since beginners usually do not have empty combs or combs containing honey and pollen (sometimes called beebread), it is sometimes much better to purchase two or three frame nuclei (very small colonies with combs), each with a queen, instead of package bees without combs, for this gives the bees the advantage of having at least two or three combs already built to start house-keeping when they arrive. Many young bees in these combs should be ready to emerge, and these little colonies begin to increase in strength at once. The greatest objection to shipping nuclei is the danger of carrying the brood, diseases of bees in this way, if the shipper is careless. When bees are shipped without combs this danger is practically eliminated.

What Kind of Hives Should Beginners Use?

Those who expect to purchase either package bees or nuclei should provide the hives and equipment well in advance, so that there will be time to put the hives together and get them ready for the bees when they arrive. A careful study of a catalog of beekeepers' supplies will greatly aid those who have not seen modern beehives to understand their construction and their various parts. Beginners are usually confused as to what style and size of hives to select. In the catalogs several different sizes, as well as different styles of hives, are listed to suit the needs or notions of different beekeepers. The size used by most of the extensive honey producers is the standard hive having 10 frames for the 10 separate combs. These frames are 17½ by 9½ inches outside measure. Some beekeepers, especially

TALKS TO BEGINNERS

Geo. S. Demuth

extracted honey producers, prefer the Jumbo hive, which is the same size as the standard hive except in depth, being $2\frac{1}{4}$ inches deeper. Formerly the standard-depth hive made to hold eight frames was quite popular in this country, and many extensive honey producers still use this size. While the expert can produce just as much honey using 8-frame hives as if using larger ones, the beginner will do well to select the larger hive, since a single 8-frame brood-chamber is not large enough for the development of full-strength colonies in the spring, and too often such small hives do not contain enough honey for winter and spring for safety. Those who desire to use a size other than the standard 10-frame hive will find it safer to use a larger rather than a smaller one. Beginners who are undecided as to which size is best suited to their locality can safely select the standard 10-frame hive, this being the size most universally used.

Where the winters are not too severe the double-walled hives with built-in packing are desirable, especially for beginners who do not expect to move their colonies often, as many extensive honey producers do. In the extreme South and in California where extra protection is not necessary in winter, as well as in the far North where the bees are wintered in the cellar or packed in large winter packing cases outside, most beekeepers prefer the single-walled hive, tho a few who winter their bees in cellars use double-walled hives on account of their better protection during cool weather after the bees are set out in the spring. Those who are undecided as to which style of hive will best suit their needs will not go far wrong by selecting the single-walled hive, preferably with the metal cover; but in most parts of the country these hives must be given extra protection either by packing them in a winter case or by placing them in a good cellar for winter. Whatever hive is selected, a full sheet of foundation should be included for each of the frames.

What Kind of Supers for Beginners?

Supers are separate chambers designed for the storage of surplus honey, which the beekeeper takes from the bees. They are placed on top of the brood-chamber or hive proper, and are so constructed that any required number of them can be tiered up on top of the brood-chamber.

Supers are made for either comb honey or extracted honey. Comb honey is usually produced in sections (small wooden boxes), but for home use and in some localities in the South for market, comb honey is produced in frames holding when filled several pounds. When comb honey is produced in sections the box is sold with the honey, but when produced in larger frames the comb honey is cut out in chunks. This is called bulk comb honey, or chunk honey.

Honey that is to be extracted is usually

produced in frames of the same size as those in the brood-chamber, the honey when finished being thrown out of the combs by means of the honey-extractor. The combs are not injured in the process of extracting, and they are given back to the bees to be refilled, so in producing extracted honey the combs to hold the surplus honey need to be built but once.

Most beginners produce comb honey at first to avoid purchasing an extractor the first season, tho comb-honey production is more difficult than extracted-honey production on account of more trouble from swarming and greater difficulty in inducing the bees to work in the comb-honey supers as readily and as vigorously as they do in extracting-supers. Until considerable skill in comb-honey production has been acquired, the yield of extracted honey is usually nearly double that of comb honey. In many cases where the honey is sold locally, extracted honey can be sold at the same price as comb honey. Wherever this can be done, of course, an extractor will soon pay for itself. On the other hand, the present wholesale price of comb honey is more than double the wholesale price of extracted honey, and in some cases it is more profitable to produce comb honey. Comb-honey production is more fascinating to most beginners, and being more difficult the beginner usually learns faster when producing comb honey.

The style of super used most extensively by comb-honey producers is the one designed for the $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{8}$ beeway sections. The style of extracting-super used most extensively is the regular standard hive-body $9\frac{1}{2}$ inches deep, which is made exactly like the standard brood-chamber, tho some prefer the shallow extracting-supers. The style of super best suited for the production of bulk comb honey is the shallow extracting-super. To hold the crop of honey, from two to four comb-honey supers will be needed by all good colonies if the season is at all favorable, or from one to three full-depth extracting-supers if extracted honey is to be produced. In some seasons double this number of supers are needed.

Full sheets of foundation should be used in all the sections and all extracting frames. Medium brood foundation is usually the best weight for both the brood-frames and the extracting frames, and thin super foundation is usually the best weight to use for comb-honey supers.

If comb honey is to be produced, about one additional hive will be needed for every two colonies in the spring for swarms, if the season is favorable for swarming. If extracted honey is to be produced, these extra hives are not necessary unless increase is desired.

In addition to hives and supers and their inside furniture, the beginner will need a

(Continued on page 177.)

THE annual meeting of the stockholders of the Colorado Honey Producers' Association will be held at the Auditorium Hotel, Denver, March 6 and 7, 1922, for the election of officers and other business.

* * *

The American League Meeting.

Fifty-six delegates and members attended the third annual meeting of the American Honey Producers' League at Salt Lake City on Jan. 30-31.

The report of the secretary-treasurer showing the following financial statement of the League was filed.

GENERAL FUND.

RECEIPTS.

Balance on hand, Sec'y Chas. B. Justice...	\$ 48.16
Balance on hand from 1920.....	466.90
Receipts from state organizations since 1921:	
Nebraska State Beekeepers' Assn.....	100.00
Colorado Honey Producers' Assn.....	325.00
Washington State Beekeepers' Assn.....	100.00
Kansas State Beekeepers' Assn.....	100.00
Texas Honey Producers' Assn.....	791.00
Texas State Beekeepers' Assn.....	50.00
Montana State Beekeepers' Assn.....	72.00
Wisconsin Beekeepers' Assn.....	91.00
Iowa Beekeepers' Assn.....	100.00
New York Beekeepers' Assn.....	18.00
Oregon Beekeepers' Assn.....	100.00
Illinois Beekeepers' Assn.....	100.00
Receipts from Allied Trades:	
G. B. Lewis Co.....	200.00
A. I. Root Co.....	200.00
Dadant & Sons.....	200.00
Leahy Mfg. Co.....	60.00
Falconer Mfg. Co.....	50.00
Illinois Glass Co.....	25.00
National Can Co.....	25.00
W. W. Boyer & Co.....	25.00
Hamilton & Menderson.....	25.00
Virginia Can Co.....	25.00
A. G. Woodman Co.....	10.00
Marshfield Mfg. Co.....	10.00
Receipts from individuals:	
B. F. Smith, Jr.....	20.00
E. B. Ault.....	20.00
H. E. Weisner.....	10.00
Wm. Glatter.....	10.00
L. D. Leonard.....	10.00
Mrs. Mary G. Alley.....	10.00
J. M. Davis.....	5.00
Bruce Anderson.....	2.00
Will M. Kellogg.....	1.50
W. E. Woodruff.....	1.00
W. P. Southworth.....	1.00
Receipts—Miscellaneous:	
Sale of Warning Posters.....	24.07
Total Feb. 1, 1921, to Jan. 31, 1922.....	\$8431.63

DISBURSEMENTS.

Stenographer hire.....	\$ 828.33
Postage.....	178.00
Printing, bulletins, stationery.....	372.70
Freight.....	4.12
P. O. box rent.....	9.00
Miscellaneous, telegrams, etc.....	3.50
Total.....	\$1395.97

Balance in General Fund.....\$2035.66

The advertising campaign was heartily endorsed. See the advertising financial report printed below. An appeal is to be made to supply-manufacturers, dealers, honey-bottlers and the manufacturers of contain-

JUST NEWS

Editors

ers to renew their advertising pledges of last year, and beekeepers everywhere are to be solicited to send in at least one cent for every colony owned as

a contribution to the advertising cause. The committee of legislation presented a draft of a bill designed to harmonize the various laws on the interstate shipping of honey. The possible importation of Isle of Wight disease was discussed, and Dr. E. F. Phillips was empowered to appoint a special committee with power to act for the League. Other bureaus of the League making reports of progress in their work were: Legal Aid, O. L. Hershisser, chairman; Arbitration, H. B. Parks; Educational, Dr. J. H. Merrill; Research, Dr. E. F. Phillips; Tree Planting, H. L. McMurtry; and the committee on Meeting Schedules, B. F. Kindig.

The president, E. G. LeSturgeon, having served for two years, asked to be released and a successor be elected. The term of office of B. F. Kindig, vice-president, and F. B. Paddock of the Executive Committee having expired, a ballot was ordered to be taken by mail among the League membership to choose these three officers. Both these ballots have been mailed and the result will be announced as soon as known.

ADVERTISING FUND.

RECEIPTS.

Receipts from organizations:	
Michigan State Beekeepers' Assn.....	\$ 192.72
Wisconsin State Beekeepers' Assn.....	100.00
Texas Honey Producers' Assn.....	350.00
Utah State Beekeepers' Assn.....	300.00
Receipts from Allied Trades:	
A. I. Root Co.....	1000.00
F. W. Muth Co.....	500.00
C. H. W. Weber.....	500.00
G. B. Lewis Co.....	400.00
Dadant & Sons.....	300.00
Falconer Mfg. Co.....	200.00
Foster Honey & Merc. Co.....	100.00
Hazel Atlas Glass Co.....	100.00
W. W. Boyer & Co.....	100.00
Leahy Mfg. Co.....	100.00
Miller Box Co.....	100.00
U. S. Can Co.....	50.00
Receipts from individuals:	
F. J. Rettig.....	100.00
J. J. Wilder.....	50.00
S. F. Lawrence.....	10.00
Ernest Kohn.....	10.00
Colin P. Campbell.....	5.00
W. W. Foster.....	5.00
John Kneser.....	.36
Receipts from sale of booklets.....	31.00
Total receipts.....	\$4604.08

DISBURSEMENTS.

Paid to Proctor & Collier Co.....	\$4166.77
Freight on booklets.....	25.85
Expressage on advertising matter.....	21.54
Standard Printing Co.....	8.00
Magazines distributed.....	5.00
Postage on booklets.....	147.47
Total.....	\$4374.63

Balance cash on hand.....\$ 229.45

FINANCIAL CONDITION OF ADVERTISING FUND.

Cash on hand.....	\$ 229.45
Unpaid pledges.....	607.28
Liabilities—Due to Proctor & Collier Co..	684.77

IN our last issue I had something to say about the tobacco habit; and, good friends, I now find I have something more to say. By the way, I have given you instances of *nearby* answers to prayer. I have in mind at least three more to mention, and these three might be called "long-range"

answers. When I first began to investigate bee culture there was very early mention of driving bees or hiving them with smoke. I think one of the first plans was the use of smoke from a cigar; and as at least a *few* people did not use tobacco they suggested rotten wood; and our good friend Dr. Miller, when he made that first visit here, suggested that a small saucepan would be an excellent thing to hold the smoking wood or punk. By blowing across the top of the saucepan he could quiet the bees very nicely without any ashes dropping on the combs. A few days after he left, however, I burned up a colony of bees by being careless with that same saucepan. In order to keep the grass and weeds down I had a good coating of sawdust put around the entrances of the hives. This made the apiary look very neat and tidy. But others, as well as myself, had trouble from the sawdust getting on fire. Later on somebody suggested a smoker made of a tin tube. You were to blow in at one end, and the smoke would come out at the other. If I remember correctly, Doolittle described and devised such a smoker; and then somebody (I do not know but it was Moses Quinby) suggested a little hand bellows to blow the smoke in order to avoid getting out of breath when one happened to have some bad hybrids. Grace Allen suggested that Quinby gave us the first bellows smoker, and I think she is right about it. But it was a small affair.

About this time T. F. Bingham of Michigan and myself each invented what we considered to be an improved form of bellows smoker. Bingham had his patented. Let me now digress a little:

I went to visit some beekeeping friends in Chatham, near Medina. Several young boys were with us out in the apiary; and some one of the crowd had a lighted cigar, and showed us how quickly the bees could be quieted with *tobacco* smoke. Thereupon one of the boys remarked that he was going to learn to smoke, in order to handle his bees in the way we had just witnessed. Then I spoke up and said:

"No, no, my young friend. Do not learn



We know that all things work together for good to them that love God.—ROMANS 8:28.

And it shall come to pass that, before they call, I will answer; and while they are yet speaking, I will hear.—ISA. 65:24.

The path of the just is as the shining light that shineth more and more unto the perfect day.—PROV. 4:18.

to smoke tobacco. I have just invented a good bellows bee-smoker. The price is fifty cents; and I will make you a present of one of these new smokers, provided that if you at any time in the future use tobacco in any form you are to pay me the fifty cents."

This caused some merriment. Then another boy spoke up and said, "Mr. Root, can I have one on the same terms?" Then still another asked, "And can I have one, too?" To both of whom I replied, "Yes, I will give any one of you a smoker on the same terms. But your names will have to be printed in our bee journal, so that everybody who knows you may keep you in mind of your tobacco pledge."

The matter was written up and printed in *Gleanings* as to how the tobacco pledge got started. But little did I know what was to be the outcome. See our first text at the head of this talk. You may be sure the mothers and sisters, wherever *Gleanings* went, took hold of this, and I hope that many of the fathers did. We were kept quite busy making smokers and giving them away. At just this time, however, Mr. Bingham informed me that my new smoker was an infringement on his patent. I told him that my invention was made prior to his. In order to settle the matter in a friendly way, Mr. Bingham paid us a visit; but the more we talked, the more it seemed plain that the matter would have to be settled in the courts. While we were discussing the matter I said:

"Mr. Bingham, tonight is our regular teachers' meeting for the study of our Sunday school lesson, and I seldom miss the teachers' meeting; so I hope you will kindly excuse me."

Let me now explain that, altho Mr. Bingham was a very bright and good man, I am sorry to say that he stood a good deal with James Heddon, who was to some extent a follower of Bob Ingersoll and Tom Paine. With this in mind, imagine my surprise when he replied, "Why, Mr. Root, I should like to attend your teachers' meeting myself. Why can't I go along with you?"

Of course, I told him that I should be very glad to have him go with me. At the close of the meeting our pastor asked me to make the closing prayer. Please remember that I was then a comparatively new convert. I do not think that I ever prayed before in public—at least not in such a gath-

ering. Satan suggested that Mr. Bingham might use my humble prayer as an occasion to cast ridicule on the followers of our Lord and Savior. On the way home he said something like this:

"Mr. Root, I want to get off bright and early in the morning. Can we not settle this matter of the smoker before we go to bed? I shall sleep a little better if we can settle it in a friendly way."

On the impulse of the moment, or *maybe* it was at the suggestion of the dear Savior, I said:

"Friend Bingham, I believe you are honest in thinking that my smoker is an infringement on your invention; but whether you are right or wrong, rather than go to the expense of settling it by law I will give way. I will stop making the smoker."

He was evidently surprised, and said:

"Why, Mr. Root, this is unexpected. Of course I will pay you something for giving me the right of way in the smoker business."

I told him I did not want anything—in fact, I preferred not to take a cent. Then we dropped the matter with the understanding that I would, at least for the present, buy smokers from him.

Now, friends, you may think me stupid; and, in fact, if it had not been that the Lord Jesus Christ has taken care of my stupidity, it would have made me lots of trouble in times past. When I reached home I told Mrs. Root about it, and she said:

"Why, my dear husband, I am afraid you have done something that you will repent of. This giving smokers away by the hundreds to those who stop using tobacco—what are you going to do about it? Are you going to buy them of Mr. Bingham at something like a dollar apiece to give away?"

Now, here comes in the stupidity. When I agreed to give up making that little fifty-cent smoker I actually *forgot* the matter of giving them to the boys if they would not learn to smoke. Then I had to own up to the dear wife that I did it without considering what would happen. Then she replied:

"Well, what are you going to do in *this* muddle?"

"My dear wife, we are going to kneel down and ask the dear Lord to help us out of this trouble just as he has helped us out of other troubles in the past."

And now, dear friends, here comes in the "long-range" answer to prayer. The next morning, when I went down to the factory I found on my desk a queer-looking package that had come in the mail after I left the office the night before. It was a bellows smoker made on an entirely new principle, and it came from away off in the mountains of California, with a letter reading something as follows:

"Mr. Root, I have invented a bee-smoker on a different principle, and I think it is

better than anything else the world has yet had. I was going to get it patented but after thinking it over I told my wife I would rather have the fun of surprising our friend A. I. Root than to get quite a sum of money out of it when patented, and here is the smoker. I know from your habits that you will enjoy giving it to the world."

I took a look at it, and then marched to the tinshop that had just been started in our new brick building, and showed it to the tinnners. To our surprise we found we had all the machinery necessary to make them at much less expense than those we had been making; and before night we had a dozen or two ready to go out. More than a thousand were given away to those who took the tobacco pledge; and all along the years since this incident kind letters have come from those who broke off from the habit years ago thru the influence of that little smoker. The man who sent me the "cold blast smoker" was our old friend, J. G. Corey of California, and it was my pleasure to pay him a visit years after; and in one of these visits I wandered away off to Puget Sound, and stopped there with an old friend, H. A. March. Over the mantelpiece was a bright new tin smoker that evidently had never been used. When I asked what it meant, friend March set it down opposite me and held up his hand, saying:

"Mr. Root, can you hold your hand any stiller than I hold mine?"

I replied, "No, friend March, I am sure I can not, for your hand is as steady as if it were made of cast iron."

Then he explained to me that some time before, maybe two or three years, he was run down, broken up, and nervous. His hand shook so that he began to think he would have to stop writing letters. He consulted the doctors, but they could not give him any help. After suffering for months he saw my offer of a smoker to any reader of *Gleanings* who would give up the use of tobacco. He said: "Now, I can not begin to tell you what a job it was; and to help me fight it out I put that smoker up there where I could see it, and it has helped me, nobody knows how many times, to hold fast to my pledge. My experience was like your father's. In just a few weeks I began to have better digestion and better health than I had known for years."

This is a sample of the letters I received, and now here is something more:

Of course the above was written up, and, as I told you, hundreds of smokers were given away. But just one year from the day we began making the cold-blast smoker we had had cash sales of over 20,000. Just one thing more:

One of the great dailies published a little item something like this:

"Down at Medina, Ohio, there is a queer chap in the bee business, and he thinks it is wicked to smoke pipes and cigars; and to

encourage the young beekeepers, he offers to give to any one of his readers a bee-smoker free of charge if said beekeeper will sign a pledge, printed in his bee journal, to use no more tobacco."

This item was put in as a joke, but it helped the sale of 20,000 smokers. After I had written the above up in our journal I gave it as a swift answer to prayer; but somebody suggested, "Why, Mr. Root, you are making a big mistake. Your good friend Corey mailed that smoker, by your own statement, before you uttered that rash promise to Mr. Bingham."

But, dear friends, I had been reading my Bible pretty thoroly from beginning to end, and I was thus enabled to point my critic to our first text—"Before they call I will answer." With the great Father above there is no past, present, nor future, and he is able to set the vast machinery of the universe in motion so as to answer the prayers of a poor humble follower like myself when he gets into trouble or thinks he has.

"WIND ELECTRICITY."

Making the Cold North Wind Warm up Homes in Denmark, Holland, and Germany.

Learning from the "Our Homes" Department that Mr. A. I. Root is very much interested in the development of electricity by wind power, I copy a couple of short news items from "Concrete," a monthly magazine published in Detroit, feeling sure that Mr. Root will be glad to read it.

ELECTRIC POWER FROM WINDMILLS.

Denmark is building windmills to produce electric power, owing to the high cost of fuel. At the Oersted Congress in Copenhagen, in 1920, Professor Dr. Phil Erik Schou read a paper on "The Modern Basis for the Construction of Windmills," published in *Ingeniøren*, April 16, 1921.

Owing to the scarcity of coal and fuel oil, an engineer, R. Johannes Jensen, was engaged to construct electric generators capable of transforming the cycle and voltage. The construction was successful, and seven windmills have been completed, transforming the energy of wind to commercial electrical power. The windmills have a concrete structure, with a superstructure of structural steel supporting the wings.

The calculations of the windmills were according to the "Drzewinski" theory, founded upon Professor La Cour's Methods.—"Concrete," July, 1921.

WIND REPLACING COAL.

In our last number we mentioned the Danish wind power—electric power stations—and now find that Holland and Germany also eagerly try to benefit by this nature's auxiliary to coal. Denmark, Holland, and Germany already have more than 500 power stations utilizing wind power as a main or auxiliary motor. The last issue of *Current Opinion* states that the Perkins Corporation in conjunction with the Westinghouse Electric Co., has erected in Indiana the first perfected outfit in the United States for generating electricity from the air in violent motion. A 50-foot steel tower, topped by a large windwheel, a generator, a switchboard, and a battery are included in the operation.

This method of generating electricity is expected to bring in a new era to a farm power and light field, putting electricity within reach

of many who live where it is not now to be had.—"Concrete," August, 1921.

Geo. J. Griesenauer.
5006 Catalpa Ave., Chicago, Ill., Sept. 29, 1921.

It would seem from the last quotation that the manager of *Concrete* has no knowledge of the work that has been done for years by the Wind Electric Corporation of Wyndmere, N. D., now located at Minneapolis, Minn. And while we are discussing this subject, below is a clipping from the *Christian Herald* indicating the rapid development of electric energy in the United States:

Between 1910 and 1920 the population of the United States increased less than 15 per cent, while the number of customers of electric light and power companies increased over 250 per cent, and the amount of electrical energy sold increased over 350 per cent.

Wind Electricity in 1922.

On page 170, Gleanings for March, 1921, I suggested some other power was rather needed when the wind didn't happen to blow, especially if one wanted the wind to furnish current for running an electric auto, besides lighting the premises. At that date I didn't know of any such outfit, to be used only in an emergency. For two winters we got along very well, by using the auto, for about 5 or 6 miles a day; but the third winter there were several times when a little more "juice" would have been a help. This present winter (the fourth) since the "tropical hurricane" (see Gleanings for December, page 780), Nature to make amends has given a winter up to present time, Jan. 9, sometimes a whole week with almost no wind at all.

Our readers, of course, know of the recent reduced prices on farm lighting outfits. I recently paid Sears, Roebuck & Co. \$185 for a combined engine and generator, and when the wind doesn't blow, we use this. We get gulf kerosene here at only 14c when we buy 50 gallons at a time, and so far it stores all our batteries beautifully. As near as I have been able to figure, a gallon of kerosene will store the auto batteries sufficient to run, with one passenger, 15 or 20 miles. Call it only 14 miles, and we have only 1 cent a mile for fuel for an electric auto. Now the windmill costs nothing for fuel, but the long rubber belt costs about \$16.00 and runs on an average two years. If we run the auto 1000 miles each winter and light the premises, it will cost as much more; so we have \$20.00 for kerosene against \$16.00 for belt. But we must remember the windmill is much more expensive than the generator I have mentioned which cost \$185. On the other side, we must take into account the many more and much stronger winds in the Dakotas and other adjoining states. Now while I like the little cheap engine very much, at the same time I enjoy seeing the two windmills when there is a fair wind, in the saving of kerosene, blowing not only "shillings," but dollars right into

my pocket while I sleep. I have felt it no more than fair I should give you the above because I have in the past been so enthusiastic in regard to "wind electricity." The low price of the modern generators, together with the low price of kerosene itself, is what changes the situation.

We must credit the windmill with the fact, that owing to the slow revolution of the wind wheel (only 25 a minute) it will almost never wear out. While the kerosene engine, so I am told, is good for only four or five years, the windmill ought to last a lifetime. The wooden tower, however, will need painting about as often as a dwelling house. A painter is just now painting my first wood tower, that had two coats of paint when first put up four years ago. The expense of storage batteries and electric generator will be practically the same, as both will be required for either wind or kerosene.

Later: Today (Jan. 12) we are having the second day of a strong north wind that has stored all our batteries, and the two windmills are among "the great army of unemployed," pulled out of the wind. Our barometer told us it was coming, so I didn't waste much kerosene. I mention this, to show that Florida, as a rule, can give us "wind electricity."

Talks to Beginners.—Continued from page 172.

good smoker, a bee-veil and perhaps a pair of bee-gloves to protect his hands and wrists from stings.

How Many Colonies the First Season.

Most beginners are satisfied with one or two colonies for the first season. Much can be learned from a single colony, but there are some advantages in having at least two or three colonies to begin with. The ambitious beginner need not hesitate to undertake the handling of a dozen or more colonies the first season.

Importance of Abundant Stores.

One of the first things for a beginner to learn is the necessity of having the bees well supplied with food at all times. Bees do not waste food when they have more than they need, but store it away in the combs until needed. During the spring a vast army of workers must be reared, if the colony is to be strong enough to gather surplus honey. The rearing of these young bees requires much more honey than the bees are usually able to gather during the spring; so, if the colonies were not amply supplied with honey last fall, it will be necessary to feed them in the spring unless they are able to gather more than usual from early flowers. It is well to see that every colony has at least 10 to 15 pounds of honey in the hive thruout the spring. Bees can be fed even in the North this month, if necessary, by laying a slab of hard candy

made of granulated sugar on top of the frames against the cluster of bees; or sugar syrup, made by heating two parts of sugar and one of water, can be fed in an ordinary friction-top pail having small holes punched in the cover, the pail of syrup being inverted just above the cluster. Such a feeder should be placed in an upper story of the hive and the space around it filled with old grain bags or old clothes.

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Classified Advertisements

Notices will be inserted in these classified columns for 50c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column, or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISERS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Van Wyngarden Bros., R. C. Wittman, W. X. Johnson, F. W. Luebeck, F. W. Summerfield, C. S. Engle, J. Tom White, C. A. Mayeux, Dingee & Conard, Woodlawn Nurseries, Heller Bros., C. C. Brinton, W. H. Laws, Elton Warner, Aluminum Honey-comb Co., M. Voinche.

HONEY AND WAX FOR SALE

FOR SALE—Buckwheat honey in 5-lb., 10-lb., or 60-lb. cans. H. B. Gable, Romulus, N. Y.

FOR SALE—Light amber honey in new 60-lb. cans. J. N. Harris, St. Louis, Mich.

FOR SALE—White clover and aster honey in 60-lb. cans and ten-pound pails. John S. Field, Brooksville, Ky.

FOR SALE—Clover, amber and buckwheat honey, 60-lb. cans and 5 and 10-lb. pails. C. J. Baldridge, Kendaia, N. Y.

FOR SALE—Choice clover honey, 15c; buckwheat, 10c per pound. Two 60-lb. cans to case, f. o. b. here. Wm. Vollmer, Akron, N. Y.

FOR SALE—Buckwheat honey in 60-lb. cans, one can to case, liquefied, \$6; 2 cans to case, granulated, \$10.80. John J. Lewis, Lyons, N. Y.

FOR SALE—Buckwheat honey in second-hand cases, 120 lbs., \$9.60 each. Sample 10c. R. V. Cox, Sloansville, N. Y.

FOR SALE—A few dozen 10-lb. pails of clover extracted honey. Will sell cheap to close out. State quantity wanted. J. D. Beals, Oto, Iowa.

FOR SALE—6000 lbs. choice white alfalfa sweet clover honey in cases of 5 and 10 lb. pails, \$7.50 per case, f. o. b. Montrose, Colorado. H. R. Fisher.

FOR SALE—20 cases white comb honey, light weight, stamped NOT UNDER 10 ounce, \$4.00 per case, 24 sections to case. H. G. Quirin, Bellevue, Ohio.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gal. barrels. Samples and price on request. A. I. Root Co., 23 Leonard St., New York City.

FOR SALE—Extra-choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Fillion, Mich.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—Extracted honey, clover, 15c per pound; amber, 10c; two 60-lb. cans to case; amber in barrels, 8c; in five-case or five-barrel lots, 5% off; in ten-case or ten-barrel lots, 10% off. H. G. Quirin, Bellevue, Ohio.

FOR SALE—12,000 lbs. of choice white clover honey, well ripened, put up in new 5 and 10 lb. pails. Sample 25c. W. B. Wallin, Brooksville, Ky.

FOR SALE—Finest white clover and basswood honey in 60-lb. cans and 5 and 10 lb. pails. Sample 15c. Write for prices. A. S. Tedman, Weston, Mich.

HONEY FOR SALE—In 60-lb. tins, water-white orange, 15c; white sage, 13c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

RASPBERRY honey, blended with willow-herb, put up in 60-lb. cans. In order to close out quickly will sell for 12c a lb. We have some raspberry mixed with a small quantity of goldenrod for 10c a lb. Sample of either kind, 20c, which may be deducted from order for honey. Elmer Hutchinson & Son, Lake City, R. D. No. 2, Mich.

HONEY AND WAX WANTED.

WANTED—Honey, section, bulk comb and extracted. Elton Warner, Asheville, N. C.

BEESWAX WANTED—For manufacture into SUPERIOR HONEY FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, Ohio.

WANTED—Beeswax. We are paying 1c and 2c extra for choice yellow beeswax and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

FOR SALE.

ROOT'S GOODS AT ROOT'S PRICES. A. W. Yates, Hartford, Conn.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

YOU will make no mistake in ordering your comb foundation of E. S. Robinson, Mayville, N. Y.

SEE my large display advertisement on page 191. Jes Dalton, Bordeloville, La.

FOR SALE—Small comb-extracted outfit. Good condition. No foul brood. N. W. Hosley, Arkport, N. Y.

FOR SALE—Ten-frame hive-bodies in flat, also white clover extracted honey. C. H. Hodgkin, Rochester, Ohio.

FOR SALE — 'SUPERIOR FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

ROOT'S BEE SUPPLIES—For the Central Southwest beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE—300 P fences for 4 1/4 x 4 1/4 plain sections, new but few slightly discolored by air, \$12.00. King's Apiaries, McArthur, Ohio.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE—All of my bees and fixtures. Ask for full particulars. Reason for selling, ill health. L. E. Evans, Onsted, Mich.

FOR SALE—10-frame standard beehives with metal covers, \$2.50 each. Hive-bodies, 90c without frames. Thos. Corder, Sparta, Wisc.

FOR SALE—300 good brood-combs, 100 imperfect combs suitable for extracting only. 30 empty L. depth supers. No disease. Bargains. Porter C. Ward, Allensville, Ky.

FOR SALE—Good second-hand 60-lb. cans, two cans to a case, boxed, at 60c per case f. o. b., Cincinnati. Terms cash. C. H. W. Weber & Co., 2163 Central Ave., Cincinnati, Ohio.

FOR SALE—Jumbo and Standard hives with bees; also good 10-frame hives, metal roofs and reversible bottoms, with or without drawn combs. No disease. Horace Lamar, Liberty, Ind.

SPECIAL SALE—Low price for 30 days on 1-story 10-frame single-wall dovetail hives, KD in packages of 5. Material and workmanship guaranteed to please. Write for price stating quantity wanted. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—36 standard 10-frame deep hive-bodies with self-spacing frames. Eight Excelsior covers, 10 reversible bottoms, all new. One two-frame Cowan extractor, used very little; 15 or 20 hive-bodies used one season, two uncapping knives. Best offer by April 1 takes all or any part. Henry McIntosh, Robinson, R. D. No. 2, Ills.

FOR SALE—To further reduce our large equipment, we offer a full line of NEW and SLIGHTLY USED Jumbo and standard Langstroth bee supplies of Root manufacture. We also offer full colonies of bees in Jumbo and Langstroth hives. Complete list free. We can save you real money. No disease. The Hofmann Apiaries, Janesville, Minn.

WANTS AND EXCHANGES.

ROYAL typewriter, \$65.00. Will trade for honey, queens or offer. E. A. Harris, Albany, Ala.

WANTED—Bees on shares. M. Knudsen, 153 Institute Place, Chicago, Ills.

WILL buy or rent 25 to 150 colonies bees near Chicago. J. W. Hosie, 1618 W. Adams St., Chicago, Ill.

WANTED—Used "Buckeye" hives. Give price and number immediately. James Cockburn, Wellsboro, Pa.

BEEHIVES WANTED—Double-walled hives, must be in good condition and cheap for cash. D. H. Rice, Jr., Barre, Mass.

REGISTERED Shorthorn cow and two heifers. Will exchange for bees, if warranted disease-free. C. L. Monier, Sparland, Ill.

WANTED—A bee inspector for Fremont County for the season of 1922. Address communications to W. E. Chadwick, Lander, Wyo.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

BEESSWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

TRADE—Winchester repeating 12-gauge gun, model 1897, with leather case. All good as new; price \$40.00. For Italian bees and queens. Dr. W. S. Windle, Oskaloosa, Iowa.

FOR SALE OR EXCHANGE—28 10-frame supers, nailed and painted, used 3 years. For 4 1/4 x 4 1/4 x 1 1/2 beeway sections. Mineola Apiaries, Bath, N. Car.

WANTED—200 or less colonies of bees, any style hive, for spring delivery. When quoting price please remember 6c to 8c honey is in sight for next crop. Address A. W. Smith, Birmingham, Mich.

OLD COMBS, cappings or slumgum wanted for rendering by steam press process. We pay cash for wax rendered, trade for supplies, or work it into foundation. W. T. Falconer Mfg. Co., Falconer, N. Y.

FOR SALE OR TRADE—For pure-bred Nubian doe a young pure Nubian buck from one of the best herds in California. Has been tested and ready for service. R. M. Collins, 630 S. 22nd St., Muskogee, Okla.

PACKAGE BEES WANTED—I expect many more orders for package bees than I have bees for sale. Breeders and others having more bees than they can sell will do well by getting in touch with me. E. D. Townsend, Marksville, La.

FOR TRADE OR SALE CHEAP—Good sectional honey-box machinery. Automatic V-groover, a fine double-head beeway cutter for sections and Hoffman frames, and a dovetailing machine. Can use some brood foundation and 10-frame L. hive-bodies. O. H. Townsend, Otsego, R. D. No. 2, Mich.

EXCHANGE—I have a 400-egg Queen incubator to trade for one small extractor, colonies of Italian bees in Root standard 10-frame or Buckeye hives, or 3-frame nuclei with queens. Must guarantee no disease. R. F. Pratt, R. D. No. 23, Box 13, East Akron, Ohio.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings or slumgum. Send for our terms and our 1922 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Son, Hamilton, Illinois.

FOR TRADE—A 5 and 2 H. P. marine Detroit engine, running order. Medical books, office chair, instruments, spray outfit, Old Trusty incubators, fine muzzle-loading rifles, for package bees and queens, or colonies, Alexander feeders, capping melter, power extractor, 4 1/4 x 4 1/4 x 1 1/2 sections. Doctor Gibbs, Waldron, Mich.

WANTED—To hear from parties that have bees to sell in the following states, either with a farm or separate. State the amount that you have in the first letter, and just what you want for them, and all information, as to condition of bees, whether you have disease, and just what you have in the way of a farm; farm need not be large, but location must be good; price must be right, and in keeping with the times, Michigan (central part preferred), Wisconsin, Mississippi, Alabama, Illinois or New York. O. S. Mullin, 42 Morgantown St., Uniontown, Pa.

SEEDS AND PLANTS.

"We will not guarantee the purity of any seed advertised nor any nursery stock, as nurserymen ordinarily will not do this themselves; but any seedman or nurseryman advertising in our columns will have given us excellent references in advance, and our readers may consider this fact in their favor."—From Our Guarantee and Advertising Conditions.

HUBAM—SCARIFIED, POUND, \$1.45; 10, \$11.00; 25, \$25.00; prepaid.—Phelps, Shawnee, Okla.

FOR SALE—Northern-grown Hubam clover seed, \$2.00 per lb., prepaid. Homer Flickinger, R. F. D. No. 2, Cheboygan, Mich.

HUBAM—AMES, IOWA, STRAIN, SCARIFIED, RECLEANED.—State test shows 99% pure and no weed seeds.—You don't pay for hulls, trash or weed seed.—Order from these ads. You'll be pleased. Distance is no barrier.—We deliver:—100 pounds, \$70.00.—Chas. B. Phelps, Shawnee, Okla.

HUBAM clover seed, ½ lb., \$1.00; lb., \$1.75; 10 lbs., \$16.50. Noble Nursery, Noble, Okla.

PURE Hubam, unhulled clover seed, 1 lb., \$1.10; 5 lbs., \$5.00, postpaid. Evan Jones, Williamstown, N. J.

HUBAM CLOVER—Genuine Hughes strain, scarified seed. 1 oz. to 16 oz., 15c oz.; 1 lb. to any amount, 90c lb. net. Sacks free. Post or freight paid. Jas H. Kitchen, R. D. No. 5, Springfield, Ohio.

HUBAM.—SCARIFIED, RECLEANED, GENUINE; no other sweet clover within miles.—References, and full proof furnished.—Note—all our prices are prepaid:—10 pounds, \$11.00; 25, \$25.00; 50, \$40.00; 100, \$70.00.—Phelps, Shawnee, Okla.

BEES AND QUEENS.

FOR SALE—Italian queens, nuclei and packages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, \$1.00 each. W. G. Lauver, Middletown, Pa.

TRY ACHORD'S BEES and QUEENS. Price list by return mail. W. D. Achord, Fitzpatrick, Ala.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

A card will bring our circular and price list of our reliable bees and queens. R. V. Stearns, Brady, Texas.

BOOKING orders now for early queens and package bees. Write for prices. Sarasota Bee Co., Sarasota, Fla.

WARNER'S QUALITY QUEENS—Write for illustrated catalog. Elton Warner, R. D. No. 1, Asheville, N. C.

FOR package bees and Italian queens, write Jones & Stevenson, Akers, La. Safe arrival and satisfaction guaranteed.

FOR SALE—Carload bees, nuclei, pound packages, full colonies. See our ad elsewhere. The Stover Apiaries, Mayhew, Miss.

PHELPS GOLDEN QUEENS will please you. Mated, \$2.00; 6, \$10.00; or \$18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

ROSEDALE APIARIES, Route No. 2, Alexandria, La., J. B. Marshall and H. P. Le Blanc, Props. See our larger ad elsewhere.

QUEENS, day-old and untested. Bees, 2-lb. packages. Thompson safety cages. Resistant Italians. Circular ready. James McKee, Riverside, Calif.

BUSINESS-FIRST queens offer you their illuminated descriptive handbook with prices, select untested, \$1.50. M. F. Perry, Bradentown, Fla.

PACKAGE BEES—\$1.50 per pound. Untested Italian or Carniolan queens, \$1.25 each. See larger adv. Circular free. J. E. Wing, 155 Schiele Ave., San Jose, Calif.

WE are booking orders now for spring delivery for the famous "Colorado Queens." Send your order early so as to be sure to get your queens. C. I. Goodridge, Wheatridge, Colo.

SELECT THREE-BAND ITALIANS, tested queens, \$2.50 each; untested, \$1.25 each, any number. Send for circular. Geo. W. Coltrin & Son, Mathis, Texas.

FOR SALE—100 colonies of certified Italian bees 8 L. shipping hives. Hives to be returned at my expense. Under state supervision 23 years. Charles Stewart, Johnstown, N. Y.

FOR SALE—Home and apiary, dwelling and honey-house, and 4 lots, 120 colonies of bees, supers, drawn combs, power extracting outfit, no disease. C. H. Harlan, Spring Valley, Wis.

FOR SALE—75 colonies bees in 10-frame Langstroth hives, now packed with abundant stores. W. C. Riddings, Lawrenceburg, Ind.

PACKAGE bees and nuclei. Booking orders 1922 delivery. See ad elsewhere or write. Canadian orders not solicited. M. L. Nisbet & Bro., Bainbridge, Ga.

FOR SALE—10 colonies Italian bees in standard hives. Also 30 supers with drawn combs. Never had disease. Write Emil Uyldert, New Brunswick, N. J.

MOTT'S Northern-bred Italian queens. Will have packages of bees to offer in June. Plans "How to Introduce Queens" and "Increase," 25c. E. E. Mott, Glenwood, Mich.

FOR SALE—15 colonies of Italian bees of 10 frames, wired and combs built from full sheets of foundation. \$10.00 per colony. H. Shaffer, 2860 Harrison Ave., Cincinnati, Ohio.

FOR SALE—Three-band Italian queens, select untested, \$1.00 each; \$12.00 per doz. 2-lb. package with queen, \$5.00. Satisfaction guaranteed. W. T. Perdue & Sons, Fort Deposit, Ala.

FOR SALE—Early package bees, nuclei and queens. We handle 1800 colonies. Shipping season March 1 to June 1. Lovett Honey Co., Phoenix, Ariz.

FOR SALE—Bright Italian queens, 1, \$1.25; 12, \$12.00. Write for prices of nuclei and pound packages. Safe arrival guaranteed. T. J. Talley, Greenville, R. D. No. 3, Ala.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

FOR SALE—Golden Italian queens ready May 1. 1 queen, \$1.25; 6, \$6.50; 12, \$12.00; 100, \$85.00. Virgins, 50c each. Write for prices of nuclei. W. W. Talley, Greenville, R. D. No. 4, Ala.

YOUR name on a card will bring by return mail descriptive booklet with prices of my Improved Strain of Italian queens. Twenty-four years' experience. J. B. Holloper, Queenbreeder, Rockton, Pa.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, \$1.00 each; \$10.00 per dozen; \$75 per 100. Pure mating, safe arrival and satisfaction guaranteed.

FOR SALE—10 colonies Italian bees in 10-frame Root hives, combs built from full sheets foundation. Young queens. No disease. Each \$8.00. Three 10-frame Root hives, each \$2.00. Pearl Barton, Gentryville, R. D. No. 1, Ind.

FOR SALE—A complete bee-yard of 40 colonies. Material for 100 more. Honey-house, 10 x 14. 10-frame hives, everything new. In best location. Spring feed in abundance. Alfalfa all around. J. T. Hamersmark, 645 W. 6th St., Reno, Nev.

2-POUND PACKAGES—3-banded Italian bees with queens, \$5.25 each, 10 or more, \$5.00 each; one-fourth down books order. Shipment begins April 20, no disease and perfect satisfaction guaranteed. J. J. Scott, Crowville, La.

MY GOLDEN ITALIAN QUEENS possess the qualities which make beekeeping profitable. Mated, \$1.00 each, \$10.00 per doz. Virgins, 50c each or \$4.25 per doz. Safe arrival and satisfaction guaranteed. Your orders solicited. Crenshaw County Apiary (Melvin Talley, Prop.), Rutledge, Ala.

EXPRESS is lower on northern bees. Prices no higher. 2 lbs. Italian bees with queen on comb of stores in May, \$5.75. Comb of stores insures success. Prompt delivery and safe arrival guaranteed. Card brings circular of golden and 3-banded queens. Ross B. Scott, LaGrange, Ind.

FOR SALE—Package bees and Italian queens. We have been shipping packages and queens for years. Try us! Allenville Apiaries, Allenville, Ala.

FOR SALE—Three-banded Italian bees, with good queens, in either Jumbo or Langstroth hives. No disease. Send for complete description. The Hofmann Apiaries, Janesville, Minn.

BOOKING orders for spring delivery. Queens, package bees, and nuclei. The reliable A. I. Root strain. Golden and leather-colored Italians. Virgins, 60c; untested, \$1.25. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

ORDERS booked now for spring delivery, 3-frame nucleus and queen, \$6.50; select tested, \$7.50; Dr. Miller's strain. No pound packages. Low express rates and quick transit north. 10% with order. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

BEES BY THE POUND—I am prepared to furnish for April or May deliveries Italian bees in one, two or three pound packages. Shipped in Root-Pritchard or Root combless shipping cages. Correspondence solicited. G. O. Pharr, New Iberia, La.

COLORADO HEADQUARTERS for QUEENS—Northern-bred leather-colored three-band Italians. Safe arrival guaranteed. Booking orders now for June 1st delivery. Send for circular and price list. Loveland Honey & Mercantile Co., Loveland, Colo.

BRIGHT ITALIAN QUEENS, \$1.00 each, 10% less in dozen lots. Pure mating, safe arrival and reasonable satisfaction guaranteed in U. S. and Canada. Write us for prices on package bees. We have them in season. Graydon Bros., Rt. 4, Greenville, Ala.

FOR SALE—Three-band leather-colored bees and queens—big cut in prices. No disease. Safe arrival and satisfaction guaranteed. Shipping season April 15 to May 25. Send for circular and prices on quantities. J. M. Cutts & Son, R. D. No. 1, Montgomery, Ala.

MERRILL'S Selected Italian Queens combine the qualities you want. They are large, vigorous, well marked, beautiful and gentle. Try them at \$1.00 each; 6, \$5.50; 12, \$10.80. Ready after April 15. I ship nothing but the best. Order now. G. H. Merrill, Greenville, R. D. No. 5, S. C.

FOR SALE—200 colonies Italian bees in new standard 10-frame hives. Requested last August with the famous Root queens. Price \$10.00 per colony. Also 15 colonies, same as above, in 8-frame hives, halved together at the corners. Price \$7.00 per colony. James Dearmin, Oakland, Minn.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL and GENTLE. Virgins, \$1.00; mated, \$2.00; 6 for \$10.00, or \$18.00 per doz.; tested, \$5.00. Breeders, \$10.00 to \$20. Safe arrival guaranteed only in the U. S. and Canada. C. W. Phelps & Son, Binghamton, N. Y.

MAY delivery, one, two and three pound packages, \$3.00, \$4.00 and \$5.00. Nuclei, \$3.00, \$4.25 and \$5.50, with select untested Italian queens. Special orders solicited. Select untested three-band queens, April and May, \$1.25, 6 or more, \$1.00 each. 20% books order. State health certificate. Safe arrival and satisfaction guaranteed. Address Apalachicola, Fla., office, Tupelo Honey Co., Columbia, Ala.

BEES—2-lb. packages, \$3.50; 6 or more, \$3.45; 12 or more, \$3.40; 25 or more, \$3.25; young Italian queens, \$1.25 extra. Shipments April 10 to May 1, by express f. o. b. New Orleans. Hardy three-banded and leather-colored stock, free from disease, shipped in Root cages on frame of foundation, safe arrival and satisfaction guaranteed or money refunded. 25% deposit to book your order. Order early and state date you prefer shipment. Reference A. I. Root Co., New Orleans, La. R. S. Knight, 4927 Conti St., New Orleans, La.

THE ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Our aim is not quantity but quality. Our first consideration is to give perfect satisfaction. Untested, \$1.50 each; 6 for \$8.00; tested, \$2.00 each; select tested, \$3.00 each. P. of. W. A. Matheny, Ohio University, Athens, Ohio.

FULL COLONIES, 2-FRAME NUCLEI, PACKAGE BEES and ITALIAN QUEENS from the apiaries of E. R. King, formerly Deputy Inspector of Ohio, later in charge of Apiculture at Cornell University. Write us what you want. Prices and information will be sent you. King's Apiaries, McArthur, Ohio.

FOR SALE—18 colonies Italian bees, on full sheets wired foundation in Hoffman frames, will sell one or all and deliver when weather allows. No disease. A certificate if desired. Many of these colonies are headed by 1921 queens from the Stover Apiaries. \$10.00 for Stover queens; \$9.00 for others. Benj. B. Jones, Lake Roland, Md.

FOR SALE—200 colonies of the celebrated Moore strain of leather-colored Italians. They are in Langstroth hives, combs all built on wired foundation. All have tested queens less than one year old. No disease among or near them. Price in lots of one to 50, \$12.00 each; 50 to 100, \$11.50 each; 100 or more, \$11.00 per colony. Elmer Hutchinson & Son, Lake City, Mich.

FOR SALE—Golden Italian queens and bees, untested, 1 queen, \$1.00; 1 doz., \$10.00; 100, \$75.00. 2-lb. package, with queen, \$5.00; 1-lb. package with queen, \$3.00; 12 or more, 5% off. 2-frame nucleus with queen, \$5.00; 15 or more, 5% off. Safe arrival and satisfaction guaranteed. J. F. Rogers, Greenville, R. D. No. 3, Ala.

FOR SALE—Package bees for spring delivery, three-banded strain, bred for business, 20% cash books your order. Safe arrival and satisfaction guaranteed. A two-pound package of bees, and select untested queen for \$5.00; 25 or more for \$4.75 each. Write for prices on larger lots. Caney Valley Apiaries, J. D. Yancey, Mgr., Bay City, Texas.

LARGE, HARDY, PROLIFIC QUEENS. Three-band Italians and Golden. Pure mating and safe arrival guaranteed. We ship only queens that are topnotchers in size, prolificness and color. After June 1: untested queens, \$1.50 each; 6 for \$8.00; 12 or more, \$1.40 each; 25 or more, \$1.25 each. Tested queens, \$3.00 each; 6 for \$16.00. Buckeye Bee Co., Zoarville, Ohio.

WE know our queens are much better than all the rest. By actual test side by side, all workers look just alike. Three bands only. If they show the slightest trace of four bands, fire them back to us, for that shows very poor breeding indeed. Pure bred Italian bees only show three bands. Untested, \$1.00; select untested, \$1.25; tested, \$2.00; select tested, \$3.00. F. M. Russell, Roxbury, Ohio.

CONNECTICUT queens. Highest grade 3-banded Italians ready June 1. Select untested, \$1.25 each; 6, \$6.50; 12, \$12.00; 50, \$47.50; 100, \$90. Two lbs. bees with queen, \$5.00; 3 lbs. with queen, \$7.00. Two-frame nuclei with queen, \$5.50; 3-frame with queen, \$7.50. Select virgin queens (not culls), 50c each, \$45.00 per 100. No disease and satisfaction guaranteed. A. E. Crandall, Berlin, Conn.

THAT PRITCHARD QUEENS and PRITCHARD SERVICE made a hit last season is proven by the many letters of appreciation and repeated orders received. This year we are BETTER PREPARED with a LARGER OUTFIT and REDUCED PRICE. Three-banded Italians, untested, \$1.25 each, 6 for \$7.00; select untested, \$1.50 each, 6 for \$8.50; select tested, \$3.00 each. Queens clipped free on request. We are booking orders now. Send yours at once and we will do our best to ship on date you desire. Acknowledgment and directions for introducing sent on receipt of order. Safe arrival and satisfaction guaranteed. Untested ready about June 1. Arlie Pritchard, R. D. No. 3, Medina, Ohio.

FOR SALE—Limited number 3-lb. package bees with untested Italian queen, \$5.50 each, $\frac{1}{4}$ cash with order. Shipped June 1 to 10. No foul brood in county. Mineola Apiaries, Bruce Anderson, Owner and Operator, Bath, N. Car.

My 1922 queens and bees for sale, the big yellow kind, none better. Satisfaction guaranteed or money back. Price, untested, \$1.00 each; \$10.00 per doz., or \$80.00 per 100. Tested, \$1.75. E. F. Day, Honorville, Ala.

THREE pounds of bees, shipped on a Hoffman frame of brood and honey, with an untested Italian queen for \$6.00. No disease, satisfaction and safe arrival guaranteed. 25% books your order for April and May shipments. E. J. Beridon, Jr., Mansura, La.

FOR SALE—Three-banded Italian bees and queens. 2-lb. package with queen, \$4.75; without queen, \$3.75. Queens, \$1.00 each, \$11.00 per dozen; 25 per cent cash books order; safe arrival and satisfaction guaranteed in U. S. and Canada. We ship nothing but the best. W. C. Smith & Co., Calhoun, Ala.

I EXPECT to be ready to start shipping 3-lb. packages of bees with 1 frame, 1 untested queen, at \$6.00; 2-frame nuclei with untested queen, \$4.50, about April 15. Young tested queen, 50c extra, or \$1.50 each. I think I was the second to ship packages of bees from this state and know how to serve customers. F. M. Morgan, Hamburg, La.

FOR MAY DELIVERY—One vigorous Italian queen, one frame emerging brood, one pound bees, price complete, \$5.00. Additional pound bees, \$1.00. Additional frame of brood, \$1.00. Banat mixed queens and bees 5% discount. After May 25 10% discount on all. Safe arrival guaranteed. Send 10% to book order. T. W. Livingston, Norman Park, Ga.

"SHE-SUITS-QUEENS." See advertisement on inner back cover of the January issue. The generous discount is for the purpose of getting my orders booked before the season opens. It is a great advantage to a queen-breeder to know weeks ahead just how many queens he must get ready. If he does not know, he either will have hundreds on hand with no sale at times, or will have orders for hundreds and no queens to fill the orders. The discount will positively be discontinued at the opening of the season. Get your orders in early that you may be sure of your dates. Allen Latham, Norwichtown, Conn.

LOW PRICES—High quality stock for 1922, 2-frame nuclei and untested Italian queen, \$5.00 each; 25 or more, \$4.75 each. 3-frame nuclei and untested Italian queen, \$6.50 each; 25 or more, \$6.25 each. If tested queens are wanted, add 50c per nucleus. All prices f. o. b., Macon, Miss. No disease has ever been in our yards. Will replace any loss or refund money, on purchaser sending us bad order receipt from express agent. Terms: 10% of amount with order, balance just before shipment is made. Order early and get your bees when you want them. Hummer Bees, Queens and Service will give satisfaction. No queens except with nuclei. Geo. A. Hummer & Sons, Prairie Point, Miss.

AN OPPORTUNITY FOR A BIG BEEKEEPER—Do you want to keep bees in an excellent tropical climate in the Dominican Republic, where there is NO BEE DISEASE? Laws to keep it out. Honeyflows from December to August. No winter problem. My five apiaries of about 1000 colonies in a radius of 15 miles, all in standard 10-frame hives, are capable of producing nearly 500,000 pounds of fine honey annually. Experienced help cheap. Living costs very low. Good local market or freight rates to N. Y. less than 10c a gal. Selling for family reasons, old age, and ill health. Everything including lands, houses, tanks, extractors, supers and all necessary equipment, including a Ford, for immediate sale or on shares to the right man, who can pay me from his profits. Address until April 1. H. J. Brandon, 2007 Jackson St., N. E. Washington, D. C.

BURLESON ITALIAN BEES AND QUEENS—In 2 and 3 lb. packages; 1 2-lb. package with select untested queen, \$5.00; 25 or more, \$4.50; 1 3-lb. package with select untested Italian queen, \$6.25; 25 or more, \$5.75. Ten per cent with order, balance 10 days before shipment; 1000 colonies to draw from. Can deliver the goods on time. Safe arrival and satisfaction guaranteed. T. W. Burleson, Waxahachie, Texas.

BEES—Engage your queens from any reliable dealer, and we will furnish you the bees. One-lb. pkg., \$1.35 each; 2-lb. pkg., \$2.50 each; 3-lb. pkg., \$3.00 each. No orders accepted for less than 5 lbs. 10% will book your order. Bees will move exact date ordered. 1500 colonies to draw from. Our apiaries are favorably located for early breeding, hence all orders filled with young, vigorous bees. Never had a case of disease in our apiaries. We are experienced shippers. We give a full guarantee, safe arrival and satisfaction. Brazos Valley Apiaries, H. E. Graham, Prop., Gause, Texas.

FOR SPRING DELIVERY—Vigorous leather-colored Italian queens, famous three-banded stock, also bees in packages. Can ship April 15 or May 1. Two-pound package with laying queen, \$6; three-pound package with laying queen, \$7.25. Three-frame nucleus with laying queen, same price as three pounds bees with laying queen. If you wish a purely-mated queen in a package, add \$1. I offer thoroughbred stock, and stock bred for business. I am now booking orders for spring delivery. Safe arrival guaranteed, or replacement or money refunded. Order early. C. M. Elfer, St. Rose, La.

PACKAGE BEES—I offer for sale 100 4-lb. packages of hybrid bees with hybrid queens, not over one year old, no guarantee of purity, at the same price and condition as the lot offered from Georgia in another liner. Also 100 2-lb. packages hybrid bees and hybrid queens as above, only most of the 2-lb. packages will be supplied with young untested queens, bred from pure stock; mating not guaranteed at the low price I am offering them as follows: One 2-lb. package with queen, \$5.00; 10 or more packages at \$4.00 each. These bees are from La. and to be sure of getting any quantity of them would advise wiring or writing at once, as they will go fast at this low price. No disease ever in this locality. Safe arrival guaranteed. Address E. D. Townsend, Marksville, La.

ITALIAN BEES AND QUEENS—I am wintering tested queens, reared late last fall, for early shipments with packages. Pound packages shipped with comb. Shipped when you want, with tested queens, 2-lb. pkg., \$5.75; 12 or more, \$5.50 each; 3-lb. pkg., \$7.25; 12 or more, \$7.00 each. Nuclei, per frame, same prices respectively as pound packages. For May delivery with untested queens, deduct 50c per package. Queens, May and June, untested, \$1.50; 12, \$1.25 each; select untested, \$2.00; tested, \$2.25; 6, \$2.00 each; select tested, \$2.75. 10% discount on orders for queens received prior to April 1. Certificate of inspection with shipments. Satisfaction and safe arrival guaranteed. 25% books your order. J. L. St. Romain, Hamburg, La.

QUEENS AND PACKAGE BEES—March 1 finds us ready for shipping. Let us book you for short notice shipping. Bees and queens for your unpacking time. We have just added 1200 colonies of bees to our business in Mesa, Ariz., with our Mr. Jas. Lisonbee, where weather and spring conditions are ideal for March and April package bees. All queens will be shipped from our large queen yards at Sandia, Texas, where we breed our pedigreed strain of three-band leather-colored queens from tested honey-producing mothers, and 8 miles out we breed our special golden queens that produce bees solid yellow to the tip. Very gentle, prolific and good honey-getters. 1 untested queen, \$1.50; 25 or more, \$1.25 each; 1 select untested queen, \$1.70; 25 or more, \$1.40 each; 1 select tested queen, \$3.00; tested breeder, \$5.00. 1-lb. package bees, \$2.25; 25 or more, \$2.15; 1 2-lb. package bees, \$3.75; 50 to 100, \$2.60 each. Larger size quoted on request, also parcel post packages. Safe arrival guaranteed. Send all orders to Dr. White Bee Company, Sandia, Texas.

FOR SALE—100% queens bred from extra-select Jay Smith breeder. Larger queens from my cell builders reinforced with hatching brood and mated in standard frame nuclei. I guarantee safe arrival and entire satisfaction and that every queen lays before being caged. Also package bees. I am after a name and reputation. Give me a trial. Select untested, 1, \$1.25; 6, \$7.00; 12, \$13.00; 25 to 100, \$1.00 each. H. Peterman, R. F. D., Lathrop, Calif.

PACKAGE BEES—While publishing the Beekeepers' Review I sold thousands of packages of bees for others and I do not think I ever offered a better bargain on bees than I can offer on 200 4-lb. packages from Georgia. They are really a one-frame nucleus containing 4 lbs. of bees, the comb containing the feed for the bees while in transit. There is really no loss in shipping bees this way, as I know from long experience in shipping hundreds of packages. The queens are tested three-banded stock less than a year old, except a few mismated ones which will be replaced by young ones reared this spring. There has never been disease in this location. Safe delivery by express guaranteed. Delivery to be made between April 20 and May 10. The regular price of package bees seems to be \$2.00 per pound and tested queens, \$2.00 each, which would make one package at market price cost \$10.00. I quote 10 4-lb. packages of bees with tested queens at \$60.00; 50 packages at \$287.50; 100 packages, \$550.00. Large purchasers had better wire in their order, as they will not last long at this low price. Write or wire me here at my winter home. Address E. D. Townsend, Marksville, La.

QUEENS—Bright, three-band Italian. We are now booking orders for the season of 1922. Shipments of queens this year will commence on March 15. All queens are mated in standard full-sized nuclei. We operate four thousand standard full-sized nuclei. Capacity and output this season five thousand queens per month. We own, operate and run for extracted honey in the states of California and Nevada twelve thousand colonies of bees. All of our breeders are selected queens whose colonies headed these twelve thousand colonies of bees last season. Better selection of breeders cannot be equalled or had anywhere. We have the capacity and output of queens to make shipments promptly and as when promised. We guarantee safe arrival of queens. Prices—Mated, untested queens, 1, \$1.00; 6, \$5.50; 12, \$10.00. In larger quantity, 75c each. Terms, 10% deposit on booking order. Balance at time of shipment. See our large advertisement in this magazine. Western Bee Farms Corporation (Principal); Western Honey Corporation and Western Citrus Honey Corporation (Associated Corporations); Claus Spreckels Building, No. 703 Market Street, San Francisco, California.

MISCELLANEOUS.

FOR SALE—A Cinch telescope, surveyor's compass, little used, very accurate. O. Bromfield, So, Jacksonville, Box 312, Rt. 8, Fla.

SORGHUM POP, Burbanks new popcorn, pkg. 15c, 4-oz. pkg. 25c, postpaid. Emil A. Lund, Vin- ing, Minn.

FOR SALE—One squirrel cage broom winder, one broom vine and a quantity of supplies. Good condition, price \$30.00. James S. Green, Kinzua, Pa.

TYPEWRITERS—All makes slightly used; \$20 up. Easy payments. Free trial. Express prepaid. Guaranteed two years. Payne Company, Rosedale, Kansas.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as \$10,000 per acre for each crop. It takes several years to mature but will average \$1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c, \$1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

HELP WANTED.

WANTED—An experienced beeman. State experience, reference, age, married or single, and wages wanted. W. J. Stahmann, Clint, Texas.

WANTED—Two industrious young men of good habits, to work with bees and on farm the coming season. Board and lodging furnished, 13 apiaries. N. L. Stevens, Venice Center, N. Y.

WANTED—Man to help with 150 colonies of bees, poultry and gardening at Madison, N. J. Give experience. L. W. Smith, 56 Williams St., New York City.

WANTED—Young man with general experience for the coming bee season. State qualifications in first letter. Room and board furnished. B. B. Cogshall, Groton, R. D. No. 12, N. Y.

WANTED—Clean active young man to work at bee work and learn business. State age, height, weight, experience if any, and wages expected, all in first letter. Apiaries at Filion, Mich. Address David Running, Filion, Mich., or Sumterville, Ala.

WANTED—A man to help work in bees from April 15 to Sept. 15, 1922, who has had some experience with bees. State age, experience and wages with board furnished in first letter. The Alexander Apiary, Delanson, N. Y.

WANTED—Young man for active season of 1922, in system of 10 apiaries; State age, weight, experience and wages expected in first letter. Possible permanent position for satisfactory man. Ray C. Wilcox, Odessa, N. Y.

AM prepared to take as students several young men for the bee season of 1922. They must be clean in mind and body. Operating 8 to 12 apiaries. Board given for services and something more. R. F. Holtermann, Brantford, Ont., Can.

WANTED—Four men for the coming season experienced in comb-honey production, to work in our apiaries in Montana. Give references, experience and wages expected in first letter. Steady work for right man. Weber Bros. Honey Co., Blackfoot, Idaho.

EXPERIENCE AND FAIR WAGES given to active young man willing to work for help in well-equipped beekeeping business of 600 colonies. Season April to November. State occupation, weight, height, age and experience. The Pettit Apiaries, Georgetown, Ont., Can.

WANTED—By a large and financially responsible corporation, operating at several different points in the states of California and Nevada, several experienced bee men and several helpers. Good wages (board and room) and permanent position, twelve months a year if work is satisfactory. Financial references furnished if desired. Give age, experience, and full particulars in first letter. Apply Western Bee Farms Corporation, 703 Market St., San Francisco, Calif.

SITUATION WANTED.

WANTED—Position in apiary. Have had experience. Address W. I. Reed, 118 Forest Road, Raleigh, N. C.

SEVERAL intelligent and hard-working students require work with commercial apiarists for summer. United States or Canada. Professor Millen, Guelph, Ontario, Canada.

WANTED—Work as assistant in apiary during summer, by High School teacher. Age 30, some experience, absolutely dependable. Address Paul H. Herzog, Pawnee, Ill.

WOMAN—Some experience, wants work with queen-breeder or commercial apiary, comb honey preferred, California. Barnwell, Apiculture Department, O. A. C., Guelph, Ont., Can.

Rider Agents Wanted

Select from 44 Styles, colors and sizes of Ranger Bicycles. Ride and exhibit sample Ranger and make money. Delivered free, express prepaid, on Approval.

12 Months to Pay On any Ranger if desired. Write today for our marvelous prices and terms.

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Best for windbreaks, hedges and lawn planting. Protect buildings, crops, stock, gardens and orchards. Hill's Evergreens are nursery grown and hardy everywhere. Hill's Evergreen book sent free. Write today. Beautiful Evergreen Trees at moderate prices. World's largest growers. Est. 1855.

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850,000 GRAPE-VINES

66 varieties. Also Small Fruits, Trees, etc. Best rooted stock. Genuine. Cheap. 2 sample vines mailed for 20c. Descriptive price list free. **LEWIS ROESCH, Box C, Fredonia, N. Y.**

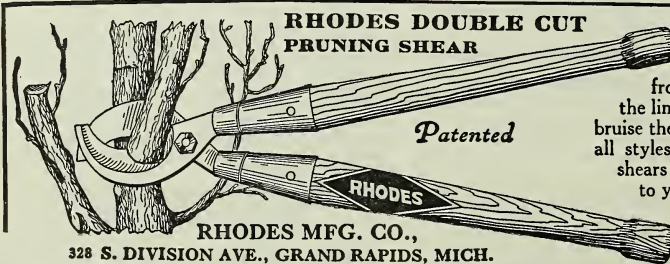
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Write for Isbell's 1922 Catalog

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BELL BRAND

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S. M. ISBELL & COMPANY

678 Mechanic St. (30) Jackson, Mich.

Notes on Transplanting.—Continued from p. 159

sunshine in California so warm and the shade so cold? One can journey from a May day in the temperate zone to something like December in the Arctic circle, by taking a few steps around the corner of a house. It affords a fascinating variation in climate.

In spite of little drawbacks like freezing temperature, low gas pressure and recent transplanting we perennials are thriving and happy, and so are the little plants, springing up around our roots, which were transplanted with us. The large pot (house in beautiful Pasadena) is comfortable now that the weather is moderating and the view on every side is wonderful. To the south are orange trees, palms, pepper trees, rose-covered pergolas and green lawns and soon there will be flowers again. To the northeast lies the mountain range with its ever changing beauty, with the glistening, snowy crown of "Old Baldy" peeping over the shoulders of the nearer mountains. The future in our chosen state looks beautiful and interesting.

450,000 TREES

200 varieties. Also Grapes, Small Fruits, etc. Best rooted stock. Genuine. Cheap. 2 sample currants mailed for 20c. Descriptive price list free. LEWIS ROESCH, Box C, Fredonia, N.Y.

Three-Banded Italian Bees & Queens

2 lbs. bees, 1 untested queen, \$5.00. Special price on 2-lb. packages without queens. No diseases. Safe delivery and satisfaction guaranteed. Ask for prices on large orders. Health certificate with each shipment.

J. L. LEATH,
CORINTH, MISSISSIPPI.

Three-Banded Italian QUEENS

Bred from queens whose bees have given big crops of honey. Pure mating and satisfaction guaranteed. May 15 to June 15: 1, \$1.50; 6, \$7.50; 12, \$13.50. All orders filled in rotation. First on list will be first filled.

J. D. KROHA, 87 North St., Danbury, Conn.

BURLESON'S OLD RELIABLE Three-Banded Italian Queens

NONE BETTER—Not as cheap as some, but worth the difference. I guarantee them to be absolutely free from brood diseases.

These are My 1922 Prices—Untested, \$1.25 each; \$13.50 per doz; 25 or more, \$1 each. Select Untested, \$1.50 each; \$15 per doz., 25 or more, \$1.15 each. Select tested, \$3 each. Considering the high quality of my queens combined with service and reliability justifies the above prices. Send all orders together with remittance to

J. W. SEAY, Mgr., MATHIS, TEXAS
T. W. BURLESON, WAXAHACHIE, TEXAS.

**BANKING
BY MAIL
AT 4%**

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This strong bank, which is under strict State Supervision, receives deposits by mail and pays 4% interest, compounded twice a year. Deposits received the first five days of the month draw interest from the first.

THE SAVINGS DEPOSIT BANK CO.
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This Ball Bearing APACHE

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PREPAID FOR ONLY

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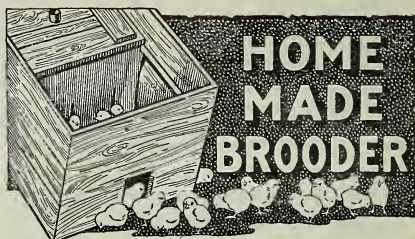


FEED the hopper, turn the wheel, and enjoy making your own wholesome whole wheat or graham flour, old-fashioned corn meal, rye flour, chops and hominy, and bring down living cost. Best coffee and spice grinder. If you have poultry, grind your chicken feed, save feed money and get more eggs.

Apache grinding plates of special mixture iron made to give longest wear. Steel ball bearings make it only a boy's job to run it. Send money or check today. Satisfaction guaranteed. For the present we can make prompt delivery. So don't delay.

A. H. PATCH, Inc., Clarksville, Tenn.

The Apache Grist Mill is companion to the Black Hawk Corn Sheller, famous for 35 years for its "Can't Wear Out" Guarantee.



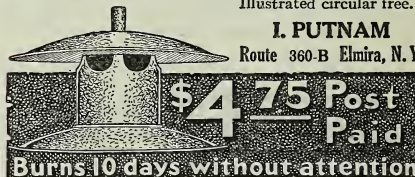
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Costs Only \$4.96, Complete

In an hour you can make a better brooder than you can buy. No tools needed but saw and hammer. It will do the work of 4 old hens and do it better. The materials, including heater, cost \$4.96.

I want you to try my Brooder and will send you plans for making it, together with a Putnam Brooder Heater, for \$4.75; all postpaid. Try the Brooder out and if you don't say it's the best Brooder you ever used, return the Heater in 30 days and get your money back. Your dealer will make you the same offer and guarantee. Ask him, but if he does not carry the Brooder Heater, send me \$4.75 and I will mail you a Brooder Heater and plans promptly.

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A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. Agents wanted. Big Profits. Write for Catalog. **THE BEST LIGHT CO.**

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Send us your name and address and we will send you a copy of our new illustrated catalog free.

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Hubam Clover

Northern Grown, Guaranteed
Pure, Scarified and with
INOCULATION

The important thing in growing a crop is inoculation. Ours is prepared by a state university's soil bacteriologist.

Buy 3 pounds of Hubam Clover Seed and Sow an Acre. Grow for honey, hay, green manure, or seed.

Price Effective Feb. 1, 1922.

3 pounds\$3.75

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(Postpaid)

10 lbs. 10.00

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Order now to sow early.
Write for Hubam Booklet.

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"Why Bees Prefer Airco Comb Foundation"

This booklet is of unusual interest to beekeepers, as it tells of the long experiments conducted, in perfecting this New Process Foundation. It tells what the New Airco is, and in what way it is an improvement, a great forward step in better and more productive beekeeping. The service coupon or a postal card will bring the booklet to you free of charge, as well as a sample of Airco Foundation. Write today.

Airco will save you real money this season because the bees do take to it first.

We are milling Airco Foundation at Council Bluffs, Iowa. Let us quote on your season's need.

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Gentlemen:—Kindly send me your free booklet, "Why Bees Prefer Airco Comb Foundation."

I would be interested in getting your
price on pounds of
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I Pay Transportation Charges on Package Bees



BANDED

- THREE
- 1-lb. package, including young three-banded queen\$4.50
 2-lb. package, including young three-banded queen..... 6.00
 3-lb. package, including young three-banded queen..... 7.50

25 cents per package less for twelve or more packages. Delivered to your address via parcel post. In comparing my prices with others, take in consideration you have no express charges to pay. Parcel post shipments go through quicker.

SELECT (one grade) untested queens, \$1.50; six, \$8.00; twelve, \$15.00. Safe arrival of bees and queens, pure mating, and satisfaction guaranteed. Let me book your order now with ten per cent cash, balance just before shipping. Shipment will be made on the day you name. I have not yet disappointed a customer. No disease.

JASPER KNIGHT
HAYNEVILLE . . . ALABAMA

Package Bees

---AND---

Reliable Queens

GOLDEN AND THREE-BANDED ITALIANS

We are now in a position to accept orders for queens and bees for spring shipping in large quantities. We have the stock and experience necessary to handle your orders, whether large or small.

- 1-lb. Package with Queen..\$3.00
 2-lb. Package with Queen.. 5.00
 3-lb. Package with Queen.. 7.00
 Tested Queen 1, \$2.50; six..12.00
 Untested1, 1.25; six.. 7.00
 Select Untest. 1, 1.50; six.. 8.00

We are in position to fill orders from 100 to 5000 queens or packages. Safe arrival and satisfaction guaranteed.

Terms, 25% to book orders.

E. A. SIMMONS
GREENVILLE . . . ALABAMA



Queens of Quality

from the famous Black Belt of Alabama, the section suited by nature to the production of queen bees. Three-banded Italians, bred for honey production, disease-resistance and gentleness. There is no disease in my neighborhood. Entire satisfaction guaranteed. Descriptive circular on request. Untested, \$1.25; Tested, \$2.00.

P. M. WILLIAMS, Ft. Deposit, Ala.

QUEENS

OUR OLD RELIABLE THREE-BANDED ITALIANS ARE HONEY GETTERS.

They are gentle, prolific, and very resistant to foul brood. Orders booked for one-fourth cash.

Safe arrival guaranteed. Circular free.

PRICES APRIL 1st TO JULY 1st.

- Untested\$1.25; over 25, \$1.00 each
 Sel. Unt. 1.50; over 25, 1.25 each
 Tested 2.50; over 25, 2.25 each
 Selected Tested 3.00 each

See our Dec. and Jan. Advertisement.

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ITALIAN BEES AND QUEENS

COMB PACKAGES AND NUCLEI FOR 1922.

Backed by years of experience in building our apiaries to a high standard by breeding from the best; we are prepared to furnish bees and queens that satisfy, and solicit your orders guaranteeing safe arrival and satisfaction. Certificate of inspection accompanies each shipment. We have found from years of experience that bees shipped on comb invariably reach their destination in very best condition.

FULL WEIGHT PACKAGES.

Booking orders now for shipment May 1, 1922. Terms: 20% cash with order.
 2-lb. package with young Italian queen, 1 or more, \$4.75; 12 or more, \$4.40; 25 or more, \$4.00
 3-lb. package with young Italian queen, 1 or more, 6.25; 12 or more, 5.90; 25 or more, 5.50
 3-frame nuclei with young Italian queen, 1 or more, 6.50; 12 or more, 6.15; 25 or more, 5.75

References: First National Bank, Bainbridge, Ga.; Maddox Commission Co., Bainbridge, Ga.; Apalachicola State Bank, Apalachicola, Fla. Members of: Florida State Beekeepers Association, Tupelo Honey Exchange, Wewahitchka, Fla.

M. L. NISBET & BRO.

Apiaries, Ranletts Ldg., Fla.

P. O. BAINBRIDGE, GA.

QUEENS

Three-Band Italians

PACKAGE BEES

QUEENS

Silver Gray Carniolans

Orders booked with 25 per cent deposit, balance just before shipping. Deliveries start April 1st. Safe arrival guaranteed of bees within 5 days of shipping point, queens anywhere in U. S. A. or Canada. Circular free.

1-pound package	\$2.00 each.	10 or more.....	\$1.75 each
2-pound package	3.50 each.	10 or more.....	3.00 each
3-pound package	5.00 each.	10 or more.....	4.50 each
1 Untested queen.....	1.25 each.	10 or more.....	1.20 each
1 Select Untested queen.....	1.50 each.	10 or more.....	1.40 each
1 Tested queen	2.00 each.	10 or more.....	1.80 each
1 Select Tested	2.25 each.	10 or more.....	2.00 each

Write for prices in large lots.

Breeders, extra selected and tested for breeding.....\$5.00 each

References by permission—First National Bank of San Jose; Security State Bank, San Jose, American Bee Journal, Hamilton, Ill.; Western Honey Bee, Los Angeles.

J. E. WING, 155 SCHIELE AVENUE, SAN JOSE, CALIFORNIA



BEES AND QUEENS

Mr. Beekeeper, if you want good quality, quick service, prompt attention, and perfect satisfaction, TRY NORMAN BROS.' pure three-banded Italian bees and queens. And see for yourself. We are going out to please our customers and to build up our business, and we know it will take honest dealing to do it. And we are going to send out just what we are advertising. Our bees are hardy, prolific, disease-resisting and honey gatherers. Orders booked with one-fourth down; balance before shipment is desired. Place your order with us. We ship when you want them.

Prices April and May.

	1	6	12	100
Untested Queens...	\$1.00	\$5.50	\$10.00	\$72.00
Select Untested...	1.20	6.50	12.00	90.00
Tested Queens	2.00	11.00	21.00	
Select Tested.....	2.50 each			

One 2-lb. package bees \$3.75; 12 or more, \$3.50 ea. Add prices of queens wanted.

We guarantee pure mating, safe arrival, free from all diseases, and perfect satisfaction in U. S. A. and Canada. Remember you take no risk when you deal with us. Isn't that enough said?

NORMAN BROS.' APIARIES

NAFTEL, ALA.

QUEENS—QUEENS—QUEENS

THREE-BAND ITALIANS ONLY.

AS GOOD AS CAN BE FOUND IN BEEDOM.

We know the demand of the beekeeper. He wants very best queens, with prompt, efficient service at prices that he can afford to pay. Our queens, service and prices meet these requirements. We have numerous reports from customers that have been more than pleased. Will begin booking orders March 1 for May and June deliveries. Never have had any contagious or infectious disease in our apiaries. Health certificate with each shipment. Circular free.

May and June—Untested: 1, \$1.25; 12, \$13.50; 25, \$25.00. Select Untested: 1, \$1.50; 12, \$16.20; 25, \$31.25. Select Tested: 1, \$2.50; 12, \$27.00; 25, \$50.00.

Pure mating, satisfaction and safe arrival guaranteed in United States (proper) and Canada. No nuclei or package bees for sale. Our capacity is about a thousand queens per month.

Herman McConnell, Robinson, Illinois.

QUEENS - - QUEENS

Three-bands and Goldens, the thrifty kind. Safe arrival and satisfaction guaranteed. Queens only. Untested: 1, \$1.50; 6, \$7.50, 12, \$13.50. Tested: 1, \$2.50; 6, \$13.00; 12, \$24.50. Select Tested: 1, \$4.00; 6, \$22.00; 12, \$41.50. Write for prices after July 1.

P. O. WATKINS,
CULLASAJA, NORTH CAROLINA.

CANDY FOR WINTER FEED

In winter bees sometimes starve with plenty of honey in the hive. Use candy and avoid this unnecessary loss. Put up in large paper plates weighing two pounds each. Write for price, also catalog of Bee Supplies.

H. H. JEPSON

182 Friend St.

Boston, 14, Mass.

QUEENS

Three-banded Italian Queens that must please and give entire satisfaction. We do not claim to have the best, but do claim them to be as good. No disease, and pure mating guaranteed.

—Prices to July the 1st—
Untested, \$1.25; 11 to 23, \$1.10 each; 24 or more, \$1.00 each. Tested, \$1.60 each; 12 or more, \$1.50 ea.

Nuclei

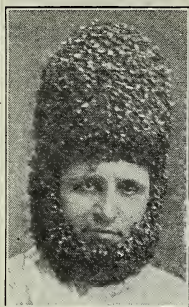
Two-fr. with untested queen...\$5.50
Three-fr. with untested queen... 7.50
Ten or more, 10 per cent less.

Cypress Bee Supplies

Hives, hive-covers, bottom-boards, supers, frames, foundation, etc. All supplies will be shipped from Coker, Ala.; all bees and queens from Crawford, Miss.

The Abston Apiaries

Crawford, Miss. Coker, Ala.



High Quality Queens

Our three-banded Italian Queens are reared from best stock under improved methods. We do not breed for quantity but breed for quality. This year we are better prepared with a larger outfit to take care of your orders. Safe arrival, prompt shipment and fullest satisfaction guaranteed. Book your order now for May and June delivery. Terms: 10% with order, balance before shipping time. Upon all orders received prior to April 1st a discount of 6% will apply, or if you prefer to send all cash with order deduct 10%.

Untested, \$1.25 each, \$13.50 per doz.; 25 or more, \$1.00 each. Select untested, \$1.50 each, \$15.00 per doz.; 25 or more, \$1.15 each. Select tested, \$2.25 each. Queens clipped free on request.

FRANK BORNHOFFER
MT. WASHINGTON, OHIO.

Rosedale Apiaries

Route No. 2,
Alexandria,
Louisiana.



J. B. Marshall &
H. P. LeBlanc,
Proprietors.

Nucleus and package bees. Can fill all orders promptly.

2-frame nucleus, \$3.75
3-frame nucleus, 4.50

Packages.

2 pounds bees, \$3.75
3 pounds bees, 4.50

Add \$1.00 for queen with package or nucleus.

*No bee disease in territory.
Guarantee safe delivery.*

¶ Mr. T. E. Spencer of Shell, Wyo., produced 249 pounds honey and increased to three colonies from 4 lbs. of Milam's bees. See Gleanings for December, 1920, pages 728-29.

* * * * *

¶ I am once more prepared to supply a limited number of queens and 2-lb. packages of bees at following prices:

1 untested queen, \$1.50; fifty or more, \$1.25. 1 two-pound package, no queen, \$4.25; fifty or more, \$4.00. Add price of queen wanted.

* * * * *

¶ Shipment begins first of May. 10% cash with order; balance just before shipment. Safe arrival guaranteed.

* * * * *

¶ References—Moore National Bank, Moore, Texas; The A. I. Root Company of Texas, San Antonio, Texas.

* * * * *

O. E. MILAM
MOORE, TEXAS.

We furnish colonies and nuclei of

Italian Bees

in hives and shipping boxes.

Tested Italian Queens.....\$2.00
 Untested Italian Queens..... 1.50
 Six Untested Italian Queens.. 8.00

—o—

A full line of Apiarian Supplies
 always in stock. Let us quote you.
 Price list on request.

—o—

Second-hand 60-lb. cans,
 2 in a case, \$0.30 a case.

—o—

I. J. STRINGHAM

GLEN COVE, N. Y.
 Nassau County.

LOOK

QUEENS OF QUALITY.
 SWARMS OF BEES BY THE
 POUND FOR 1922.
 THREE-BANDED ONLY.

Price of packages by express.

1-lb. package, \$4.00 each; 6 up to 12, \$3.90 each; 12 or more, \$3.75 each. 2-lb. packages, \$5.50 each; 6 up to 12, 5.25 each; 12 or more, \$5.00 each. 3-lb. packages, \$7.25 each; 6 up to 12, \$7.00 each; 12 or more, \$6.75 each. If wanted by express add 10 per cent extra.

Price of Queens.

Select untested, \$1.50 each; 12 or more, \$1.40 each. Select tested, \$3.00 each; 12 or more, \$2.75 each. Wings clipped on request. Pure mating of all queens is guaranteed. All of our queens are reared by experienced and expert queen-breeders, and the business management is under those having over thirty years' experience handling bees in a large way. Give us a trial order and you will be well satisfied with our prompt service and strain of bees. Every package or queen ordered is guaranteed to arrive in good condition and to give entire satisfaction. 10 per cent cash with order. Bees or queens shipped any day specified.

HAYNEVILLE APIARY CO.
 Hayneville, Ala., U. S. A.

FOR MAY DELIVERY

One vigorous Italian queen, one frame of emerging brood, one pound bees. Price complete, f. o. b. Bordelonville, \$5.00. Additional frames of broods, each, \$1.00; additional pounds bees each, \$1.00. Queen introduced and laying en route to you. Safe delivery and satisfaction guaranteed. No disease, reference given. Orders booked one-fifth down, May delivery.

Read what this customer says:

"Mr. Jes Dalton, Bordelonville, La. Enclosed is deposit on 2 packages for May delivery. The one package I got last spring increased to 14 colonies and gave me 85 pounds of comb honey. Respectfully, A. Russell Paul, Belvidere, N. J."

This shows what these balanced packages can do. And this:

"St. Thomas, Virgin Islands, U. S. A. Mr. Jes Dalton, Bordelonville, La. Dear Sir: The 2 packages arrived last night and upon examination I found about a dozen dead bees in one and about 200 in the other; quite a bit of sealed brood, some eggs and small larvæ. Very satisfactory considering the length of the shipment. Both queens had laid en route and there was plenty of honey in the combs. Yours, Axel Holst."

This shipment went by rail via New Orleans and New York, thence by steamer via Porto Rico to the Virgin Islands; were in the case 24 days in August. How is this for delivery? If they survived this trip in good condition, they will go any place in the United States. Send for address of other satisfied customers. Be sure to mention Gleanings in Bee Culture when writing.

JES DALTON, BORDELONVILLE, LOUISIANA

Light three-banded bees and queens for April, May and June delivery. We stand for stock, promptness, safe delivery, satisfaction and no disease. We want to please our customers.

All bees are shipped on Root Standard Hoffman frame, brood and honey, which means safe delivery, and equal to a pound of bees. Queens introduced laying en route.

2 pounds bees, no queen, \$3.75. Add \$1.00 for each additional pound of bees or frame emerging bees.

2-fr. nuclei well covered with young bees, \$3.75 ea. Add \$1.00 for each additional pound of bees or frame emerging bees.

The package that brings results—5 lbs. bees on two frames emerging bees, \$8.00.

Queens for the above packages, \$1.25 each; 5% discount on 20 or more packages; 15% with order; balance at shipping time.

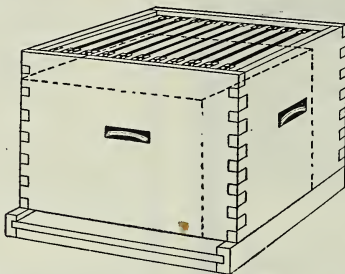
+ + +

THE HOME OF GOOD QUEENS.

Oscar Mayeux.
 Hamburg, Louisiana.

MODIFIED DADANT HIVE

Glance at the 11 frames, spaced $1\frac{1}{2}$ inches from center to center, $11\frac{1}{4}$ inches deep of the Modified Dadant hive, giving adequate room for brood and stores in one hive body.



Note the outlines of the standard 10-frame Hoffman depth hive body compared to the Modified Dadant body. You can see why more swarms and less surplus come from small hives.

The Large Hive for Extracted Honey Production

Among the reasons why the Modified Dadant hive deserves a trial, especially where present equipment is not giving satisfaction are:

**DEEP FRAMES, $11\frac{1}{4}$ IN.
FRAME SPACE VENTILATION
SWARM CONTROL EASIER
 $6\frac{1}{4}$ -IN. EXTRACTING FRAMES.**

**LARGE 1-STORY BROOD NEST
ADEQUATE WINTER STORES
GREATER BROOD ROOM
STANDARD COVERS, BOTTOMS**

Present equipment may be used as super equipment on Modified Dadant brood-chambers. Covers and bottoms for this hive are the familiar metal roof cover with inner cover and regular standard bottoms, except for larger dimensions.

THE STANDARD OF WORKMANSHIP IS "BEEWARE."

—Write for free booklet on this hive to—

G. B. LEWIS CO., WATERTOWN, WIS.

DADANT & SONS, HAMILTON, ILL.

There's a distributor near you.

Make the WEAK STRONG by using

Forehand's 3-Band Italian Bees and Queens

Make your weak run-down colonies good ones by using young, vigorous 3-band Italian Queens, backed by 28 years of successful breeding. With the cost of supplies plus the cost of production, can you afford colonies occupying perfectly good hives and combs, netting you nothing or a small profit? We must produce our honey at less cost, to meet the lower prices. Can you make a better start than by bringing those non-producers to the front? Give them a queen that will have the hive chock-full of young bees ready for the harvest, instead of being in a weak condition when bees are needed most. Give my imported stock a trial. You risk not a penny; if you are not satisfied, notify me and I will replace or refund your money. If the colony is too weak for a queen alone, get one or two pounds of my Italian Bees with queen. Introduce to the old colony and watch them build up. Let me make you one of my satisfied customers. I have thousands of them in U. S. and Canada.

Untested—1, \$1.50; 6, \$7.50; 12, \$13.50. Selected Untested—1, \$1.75; 6, \$9.00; 12, \$16.50. Tested—1, \$2.50; 6, \$13.00; 12, \$24.50. Selected Tested—1, \$4.00; 6, \$22.00; 12, \$41.50. One pound bees, \$2.75; two pounds bees, \$4.75; three pounds bees, \$6.75. If queen is wanted with bees add price. Write for prices on large lots.

N. FOREHAND - - RAMER, ALABAMA

CENTRALLY
LOCATED
TO
SERVE
NEW
ENGLAND
BEEKEEPERS.



ORDERS
FILLED
PROMPTLY.
—
CATALOG
ON
REQUEST.

BEE SUPPLIES

F. COOMBS & SONS, BRATTLEBORO, VERMONT

DON'T DELAY---GET OUR PRICES
WE SAVE YOU MONEY
“falcon”

SUPPLIES --- QUEENS --- FOUNDATION

W. T. FALCONER MFG. COMPANY

FALCONER (Near Jamestown) NEW YORK

“Where the best beehives come from.”

Price Reduction

The prices on our comb foundation mills have been reduced as follows:

	Old price	New price
Rolls 3 x 16....	\$400.00	\$240.00
Rolls 2½ x 14....	300.00	180.00
Rolls 2½ x 12....	275.00	165.00
Rolls 2½ x 10....	250.00	150.00
Rolls 2½ x 6....	225.00	150.00
Rolls 2 x 10....	200.00	120.00
Rolls 2 x 6....	200.00	120.00

THE A. I. ROOT COMPANY
MEDINA, OHIO

MASON BEE SUPPLY COMPANY MECHANIC FALLS, MAINE

From 1897 to 1922 the Northeastern Branch of
The A. I. Root Company

PROMPT AND EFFICIENT SERVICE

BECAUSE—Only Root's Goods are sold.

It is a business with us—not a side line.

Eight mails daily—Two lines of railway.

If you have not received 1922 catalog send name
at once.

Established 1885.

Write us for catalog.

BEEKEEPERS' SUPPLIES

The Kind You Want and the Kind
That Bees Need

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.



Bee Supplies!

Our plant is especially equipped to manufacture dovetailed hives, supers, frames, sections and shipping cases.

We guarantee our goods to be first class in workmanship and material.

We carry a complete line of everything for the beekeeper.

DEALERS:—Write for our dealers' proposition.

Write for our new catalog.

A. H. RUSCH & SON CO.
REEDSVILLE, WIS.

Indianapolis Is the Town You Want to Think of When You Need Beekeepers' Supplies

Our stock is 90% new, which insures you of getting clean supplies. Write us for prices. Catalog for the asking.

The A. I. Root Company
873 Massachusetts Ave.
Indianapolis, Ind.

He Doesn't Want a Pipe!

Jacksonville, Jan. 1, 1922.

The A. I. Root Co., St. Paul, Minn.

Naw! I don't want my *pipe*! And if I want my slippers, I can get them myself.

What I want is my bee supplies for the Honey Flow.

So I am going to order my bee supplies from you at St. Paul, where I can get 100% Quality and Service.

A trial order will convince anybody of their unexcelled service. They give special quotations on quantity lots, too.

JIM JACKSON,
Beekeeper.

Italian Bees

BY THE POUND OR CARLOAD.

We are now booking orders for nuclei and pound packages, spring delivery. When you buy bees you want the most for your money, quality and service considered. With 25 years' experience in honey production, we now have bred a strain of bees that are honey gatherers, prolific and disease-resisting. We are offering at a reasonable price the fruits of our labors in pound packages, and nuclei with young queens, which have been found to be the best way for northern shipments. Testimonials prove this strain of bees are giving satisfaction in Canada, Mexico and the U. S. Our guarantee: No disease, safe delivery, satisfaction.

lively, satisfaction.

	April	May	June
1-fr. nucleus with queen.	\$4.00	\$3.50	\$3.00
2-fr. nucleus with queen.	5.50	5.00	4.50
3-fr. nucleus with queen.	7.00	6.50	6.00
4-fr. nucleus with queen.	8.50	8.25	7.75
POUND PACKAGES WITHOUT QUEENS.			
1 pound Italian Bees.....	\$2.50		
2 pounds Italian Bees.....	4.00		
3 pounds Italian Bees.....	5.75		
Add \$1.50 for queen.				20% with order.

Weber Bros. Honey Co.
RIALTO, CALIF.

The Crowning Touch to the Home

It's just a house until you plant a garden. Then it becomes a **home**—a place where happiness can be found indoors or out—a living index to the character of those who live within. No wonder real home-makers give such care to planning beautiful gardens!



The choice of varieties is made easy for you by the S. & H. catalog. S. & H. ornamental shrubs are carefully selected, vigorous plants, with abundant foliage and finely colored bloom. All seeds listed are taken from unusually fine strains, proven by our own trials. S. & H. trees are preferred by professional nurserymen and orchardists all over the country. Nearly every thing you need for your garden is listed.

Be sure to send tonight for this interesting, splendidly illustrated catalog.

THE STORRS & HARRISON CO.

Nurserymen and Seedsmen

Box 162

PAINESVILLE, OHIO



HUBAM

THE NEW GIANT HONEY CLOVER

A mass of white bloom until late autumn, heavy with A-1 honey. A summer-long paradise for bees.

Hubam produces an almost incredible yield of honey, and, being annual, saves a year in crop rotation. Sown with grain, it matures after harvest for forage, soiling or seed. Six times as much nitrogenous material for plowing down as Red Clover.

1 to 4 lbs. per acre in 30-in. drills gives big seed yield. Tremendous demand—and the honey is "velvet."

Our Hubam is scarified and certified to be from original Ames stock. Write for further information and prices.



May Seed &
Nursery Co.

1120 Elm Street
Shenandoah, Iowa

Honey and Hubam

The words are synonymous

The nectar flow is abundant. Comes early and stays until late fall. Makes water-white honey so coveted by honey producers. Also a boon to the orchardist, the stock raiser, the general farmer. Seed Sense, our monthly magazine, tells about it. Just say HUBAM to us and we'll put you on our list.

Buy your seed of this wonderful new annual white sweet clover early. Buy it from a well-established firm with a reputation for squareness. Price now is \$2.00 per pound, for certified seed of our own growing.

With each and every order for Hubam we will include FREE a can of Nitragin pure culture bacteria which will insure proper growth of the Hubam plant.

HENRY FIELD SEED CO.
SHENANDOAH, IOWA.



Try Achord's Package Bees and Queens

THREE-BANDED ITALIANS ONLY.

We have the stock, equipment, and experience, and can give you prompt, satisfactory service. We have more than 1000 big, healthy hustling colonies of pure Italian bees to draw from. Write for illustrated price list.



W. D. ACHORD, FITZPATRICK, ALABAMA

BEES---ITALIAN BEES---BEES

We are booking orders for colonies, nuclei, and packages of Italian bees. The prices are as follows: Full colonies with Italian queen at \$15.00; two for \$25.00. 3-frame nucleus with Italian queen at \$6.50; 3-lb. pkg. with Italian queen at \$6.50. All combs are straight, wired, and built from full sheets of foundation. Orders filled in rotation. No disease. Our apiaries are state inspected. Safe arrival and satisfaction guaranteed.

VAN'S HONEY FARMS

VAN WYNGARDEN BROS., PROPS.

HEBRON, INDIANA.

THREE-BANDED ITALIANS ONLY BEES AND QUEENS.

I have a hardy prolific strain of bees and guarantee them to be pure and clean of disease; and they must reach you in good condition or I will make it good with you. I furnish an inspection certificate showing that they have been examined and found to be clean of diseases. We have never had any bee diseases in this part of the state. Untested Queens: 1, \$1.25 each; 12, \$1.10 each. Tested Queens: 1, \$1.60 each; 12, \$1.35 each. 1 one-frame nucleus, \$4.00; 1 two-frame nucleus, \$5.00. Nuclei are all furnished with untested queens at this price unless otherwise ordered.

H. L. MURRY, SOSO, MISSISSIPPI.

THREE-BANDED ITALIAN QUEENS WITH PACKAGE BEES AND NUCLEI.

All I have for sale are guaranteed to please. Can begin shipping April 20th. Health certificate and instructions accompany each package.

2-frame nucleus with untested queen.....	\$5.00
2-frame nucleus with tested queen.....	5.50
2-fr. nuclei in doz. lots with untested queen..	4.50
2-fr. nuclei in doz. lots with tested queen....	5.00
2-lb. pkg. hybrid bees with untested queen...	5.50
Twelve or more	5.00

25% deposit to book your order.

I have arranged for better railway service by shipping from Clarksville. Address all orders to

BAUGHN STONE, CLARKSVILLE, TEX.

INDIANOLA APIARY

is now booking orders for 1922 for Italian bees and queens. Write for price list and circular. No disease. Bees inspected by State inspector.

J. W. SHERMAN

Valdosta, Ga.

1922 ITALIAN QUEENS

Untested, \$1.20 each, 12 or more, \$1.00 each.

Select Untested, \$1.50. Tested, \$2.00.

No disease.

Package Bees Priced on Request.

D. W. HOWELL

Shellman, Ga., Box A3.

ROOT QUALITY BEES AND BEEKEEPERS' SUPPLIES.

Bees in the hive, in packages, and nuclei, three-banded leather-colored Italian queens. Let a beekeeper of long standing serve you in your requirements for 1922. Catalog on request.

O. G. RAWSON,

3208 Forest Place, East St. Louis, Illinois.

PATENTS

Practice in Patent Office and Court.
Patent Counsel of The A. I. Root Co.

Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C.

ROOT QUALITY QUEENS

SOMETHING ABOUT THEM.

Fifty years of continuous breeding up to the present Root Quality Queens and Bees. A. I. Root bought the first mother of this strain from Langstroth 55 years ago. No expense or pains has been spared to develop this strain of improved three-banded leather-colored Italians.

PRICES OF ROOT QUALITY QUEENS.

April 15 to June 30—

	1 to 9.	10 to 24.	25 to 49.	50 to 99.	100 or over.
Untested ..	\$2.00 ea.	\$1.80 ea.	\$1.70 ea.	\$1.60 ea.	\$1.50 ea.
Sel. Untested	2.50 ea.	2.25 ea.	2.10 ea.	2.00 ea.	1.85 ea.
Tested	3.00 ea.	2.70 ea.	2.55 ea.	2.40 ea.	2.25 ea.
Sel. Tested.	3.50 ea.	3.15 ea.	3.00 ea.	2.80 ea.	2.60 ea.

July 1 to November 1—

	1 to 9.	10 to 24.	25 to 49.	50 to 99.	100 or over.
Untested ...	\$1.50 ea.	\$1.40 ea.	\$1.35 ea.	\$1.25 ea.	\$1.15 ea.
Sel. Untested	2.00 ea.	1.90 ea.	1.80 ea.	1.70 ea.	1.60 ea.
Tested	2.50 ea.	2.35 ea.	2.25 ea.	2.10 ea.	2.00 ea.
Sel. Tested..	3.00 ea.	2.85 ea.	2.70 ea.	2.55 ea.	2.40 ea.

PRICES OF BEES IN COMBLESS PACKAGES BY EXPRESS.

April 15 to September 1—

C310700—1-pound package..	\$3.00; 25 or more..	\$2.85 ea.
C310800—2-pound package..	5.00; 25 or more..	4.75 ea.
C310801—3-pound package..	7.00; 25 or more..	6.60 ea.

Add price of queen wanted to package price given above.

Early deliveries will be made from our Alabama apiaries.

THE A. I. ROOT COMPANY, MEDINA, OHIO, U. S. A.

SUPERIOR ITALIAN BEES AND QUEENS

With this guarantee, that is, if they are not entirely satisfactory, we want to replace them.

Untested queens to June 15: 1, \$1.25; 10 or more, \$10.00

Tested queens to June 15: 1, \$2.00; 10 or more, \$17.00

SPECIAL

For orders received this month for shipment from May 10 to June 1 we will make a special price on good, strong three-frame nuclei with queens.

PACKAGE BEES

One pound, with queen - - \$4.00; 10 or more, \$3.50

Two pounds, with queen - - 5.50; 10 or more, 5.00

THE STOVER APIARIES, MAYHEW, MISSISSIPPI

QUEENS---QUEENS

PACKAGE BEES AND NUCLEI

Read what a breeder from France wrote: "Queen received in fine condition; after being on the road 21 days, only three bees dead. Thank you very much for sending me a \$100.00 queen for \$5.00. I used her for a breeder, and every customer that bought her daughters has re-ordered for 1922. She is a wonder. I have bought dozens of queens from Italy, and she is ahead of them all. I have compared her bees with the best breeders of the country, and she is at the top."

1922 PRICES.

**Booking Orders Now.
Safe Arrival Guaranteed.**

1-lb. package	\$2.25 each
25 or more	2.15 each
2-lb. package	3.75 each
25 or more	3.60 each
3-lb. package	5.25 each
25 or more	5.00 each
2-comb nuclei	3.75 each
3-comb nuclei	5.25 each
(Add price of queen wanted.)	
1 Untested Queen...	\$1.50 each
25 or more	1.30 each
1 Select Untested....	1.70 each
25 or more	1.50 each
1 Tested	2.25 each
25 or more	2.00 each
1 Select Tested	2.65 each
25 or more	2.25 each

It is cheaper to pay a little more and get the best; they are hustlers, hardy, very resistant to European foul brood, etc., etc. Send for circulars. I ship thousands of pounds of bees every year all over the U. S. A. and Canada. One-fifth down with order; balance just before shipping.

THE NUECES COUNTY APIARIES

E. B. AULT, Prop.

CALALLEN, TEXAS

THREE-BANDED QUEENS

BEES IN PACKAGES FOR 1922

After twenty-six years of select breeding we have a strain of Bright Three-banded Italian Bees that are unsurpassed for their disease-resisting (especially European foul brood) and honey-gathering qualities. Read what others say about them:

"Enclosed find \$75.00 for 50 queens. I want these for requeening colonies that have European foul brood as I find your strain resistant. One of the queens bought of you last season built up from a nucleus and made 360 pounds of surplus honey."—Pennsylvania.

"I find your bees gentle, best of workers, and they stand the long winters here fine."—Manitoba, Canada.

"The two-pound packages I got of you last year made an average of 150 pounds of sur-

plus honey. I find your bees not only hustlers but also gentle."—Illinois.

"The one-pound packages bought of you made a surplus average of 175 pounds of extracted honey and an increase of 39%, which is as fine a record as can be had in this locality, especially when the work is done entirely by amateurs."—Pennsylvania.

"I am well pleased with the bees I got from you last year as they paid for themselves and made a nice profit."—Iowa.

Price List of Packages With Young Queens by Express.

1-lb. packages, \$4.00 each; 12 or more, \$3.75 each. 1½-lb. packages, \$4.75 each; 12 or more, \$4.60 each. 2-lb. packages, \$5.50 each; 12 or more, \$5.00 each. 3-lb. packages, \$7.25 ea.; 12 or more, \$6.75 ea. If packages are wanted by parcel post, add 10%.

Select untested queens, \$1.50 each; 12 or more, \$1.40 each. Select tested queens, \$3.00 each; 12 or more, \$2.75 each. Wings of queens clipped free of charge. We guarantee our bees and queens to give absolute satisfaction and to arrive in perfect condition with the exception of those shipped by express to Canada. The largest packages we are able to ship by mail to Canada are our 1½-lb. Canadian Specials. Bees will be shipped promptly date named, 10% cash with order and the balance just before shipment.

M. C. BERRY & CO., BOX 697, MONTGOMERY, ALA., U. S. A.
WAS HAYNEVILLE, ALABAMA.

Give Us a Trial

We Ship When You Want Them.

We Will Book Only What We Know We Can Fill.

Italian Bees and Queens of the best strain

1-pound Package, \$2.30; 15 or more, \$2.20 each.

2-pound Package, \$3.75; 15 or more, \$3.50 each.

3-pound Package, \$5.25; 15 or more, \$5.20 each.

Young Queens Only

Italian Queens a Specialty

Write Us Your Wants.

1 Selected Untested, \$1.50; 12 or more, \$1.20; 25 or more, \$1.10.

Queens are raised for us by queen specialist and selected by us for our trade. 20% down books your order.

No Disease

Quality

Service

Valley Apiaries

A. W. Bryson, Prop.

La Feria, Texas

QUEENS

NUCLEI AND PACKAGE BEES

PRICES.

Untested Queens\$1.10 each
Over 25, \$1.00 each.
Select Untested\$1.35 each
Over 25, \$1.25 each.
Tested, \$2.00, Select Tested\$3.00 each
Breeders \$7.50 and \$10.00 each in one-frame nucleus.

Nuclei.

2-fr. with young laying queen..\$5.50 each
Over 10, \$5.00 each.
3-fr. with young laying queen..\$7.25 each
Over 10, \$6.75 each.

Combless Packages.

One pound\$2.75 each
Over 10, \$2.50 each.
Two pound\$4.25 each
Over 10, \$4.00 each.
Three pound\$6.00 each
Over 10, \$5.75 each.

PURE THREE-BANDED ITALIANS ONLY

It costs less to keep really good bees than it does inferior ones; but the returns may be several times more from the good ones. If yours are black or hybrid you should Italianize. If your strain of Italians are not giving the results you think they should, why not try some of ours?

Don't tolerate old, failing queens that have seen their day. Of course the bees may supersede them but it may be too late to insure the colony building up in time for the flow.

Requeening with a superior strain, bred for business, is the surest way to get the utmost profit from your apiary. We are prepared to deliver the goods, and we accept only the business we can deliver on time. Ask for our folder, containing testimonials, prices, etc.

Guarantee: Freedom from disease. Health certificate, also permit (where necessary) with every shipment. Safe arrival and complete satisfaction. We make prompt replacement of all shipments that arrive in bad order. Have agent make notation on express bill and send us with claim. Proper provisioning and careful packing in strong light pack-

ages have prevented a single claim in two years past.
Terms: 20% to book, balance before shipment. Express on packages and nuclei. f. o. b. here unless quoted otherwise.

JENSEN'S APIARIES, RT. 3, CRAWFORD, MISS.





Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch—all in the same operation.

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 garden tools in 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING CO.

Dept. 23.

David City, Neb.

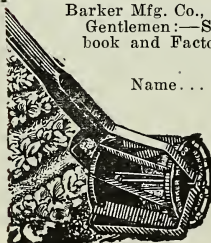
Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

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Town.....

State.....

R. F. D. or Box.....



LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Price each 18c postpaid. Made by **G.B. Lewis Company, Watertown, Wis., U.S.A.** For Sale by all Dealers.



EVERBEARING STRAWBERRIES \$1000 per acre Plants by mail, postp'd SPECIAL OFFER

Our Selection Best Varieties for Home and Market

100 Plants - - \$2.50
200 Plants - - \$4.25
300 Plants - - \$6.00

Best Up-to-Date Standard Varieties

(Not Everbearing) (Our selection.)

100 Plants, \$1.25; 200 Plants, \$2.10,
300 Plants, \$2.95. Catalog Free.

Only Best Varieties. Home of the
Everbearers. Introducers of Progressive.

C. N. Flansburgh & Son, Jackson, Mich.

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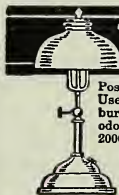


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The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.

306 E. 5th St., Canton, O.

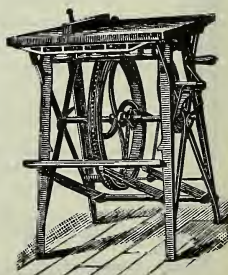
BARNES' HAND & FOOT POWER MACHINERY

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO.
545 Ruby Street
ROCKFORD, ILLINOIS



QUEENS

Bright Three-
banded Italians.

Announcement to

QUEENS

Bright Three-
banded Italians.

Beekeepers

We are now booking orders for queens for the season of 1922.

Shipments of queens this year will commence on March 15th, 1922.

All queens are mated in standard full-sized three-frame nuclei.

Our queens are bred on natural honey flows. No artificial flows used in breeding.

We are operating four thousand standard full-sized three-frame nuclei.

Capacity and output this season will be five thousand queens per month.

We own, operate and run for extracted honey in the states of California and Nevada twelve thousand colonies of bees. All of our breeders are selected queens whose colonies headed these twelve thousand colonies of bees last season.

Better selection of breeders cannot be equaled or had anywhere.

We have the capacity and output of queens to make shipments promptly as and when promised.

All queens shipped by us in six-hole mailing cages. No small-sized mailing cages used.

Prices and Terms

Mated Untested Queens

1	\$1.00
6	5.50
12	10.00

In larger quantity, 75c ea.

TERMS.

10% deposit on booking order. Balance at time of shipment.

We guarantee safe arrival of queens. Any queen arriving dead at destination will be replaced without charge.

References by permission: The A. I. Root Company of California, No. 52 Main St., San Francisco, California, and No. 1824 East 15th Street, Los

Angeles, California; The Western Honey Bee, No. 121 Temple Street, Los Angeles, California.

We respectfully solicit your patronage.

WESTERN BEE FARMS CORPORATION

(Principal)

WESTERN HONEY CORPORATION WESTERN CITRUS HONEY CORPORATION

(Associated Corporations)

GENERAL OFFICES.

Claus Spreckels Building, No. 703 Market Street, San Francisco, California.

Thagard's Queens

Bred for Quality

We have spent years building up our strain of Three-banded bees. In doing so we have not bred altogether for color, but for the many other good qualities that you want in your queens. Our queens have proven this to thousands of beekeepers. We want you to try some of them, test them against any you may obtain anywhere, **AND NOTE THE RESULTS.** Our queens are bred from imported queens, mated to domestic drones; they are hardy, prolific, gentle, disease-resistant and honey-producers. Safe arrival, pure mating, prompt service and perfect satisfaction guaranteed. Write for descriptive catalog.

ITALIAN BEES

	1	6	12		1	25 or more
Untested	\$1.50	\$7.50	\$13.50	1-lb. package	\$3.50	\$2.75
Sel. Untested	1.75	9.00	15.00	2-lb. package	5.00	4.50
Tested	2.50	13.00	24.00			
Sel. Tested	3.00	18.00	32.00			

THE V. R. THAGARD COMPANY
GREENVILLE, ALABAMA.



A card will bring
our 1922 catalog.

QUEENS

While gentleness and color are not lost sight of in breeding our queens, still the honey-getting quality of the bees is the most desirable feature. By selecting for prolificness and vigor, we have produced a strain that are splendid honey-getters.

Mr. W. A. Chrysler of Chatham, Ontario, one of the big fellows up there, writes: "The queen I got from you in 1920 and a queen I raised from her, produced a little over four hundred pounds of honey each. There was not five pounds difference in them. They outdistanced any of the rest of our three hundred colonies by about 75 pounds."

QUEEN PRICES.

Before August First	After August First
1 to 4 inclusive.....\$2.50 each	1 to 4 inclusive.....\$2.00 each
5 to 9 inclusive..... 2.45 each	5 to 9 inclusive..... 1.95 each
10 or more..... 2.40 each	10 or more..... 1.90 each

Breeding Queens for the season, \$10.00 each.

We still have a number of breeders that are not sold that can be delivered any time after April 1. We believe these are as good breeders as we have ever sold.

JAY SMITH, ROUTE 3, VINCENNES, IND.



"I've been pretty busy for the past two months. Been all over the United States, up in Canada, down in Mexico, Central America, the Canal Zone, Cuba and Jamaica. Made a few trips over to the British Isles and down in Italy and over to India. They even sent for me over in Australia and China.

"O, the distance doesn't count. The boss pays all the expenses and I enjoy the trips. You see it makes no difference how little you appreciate my visit or how much good it does you, you can't lose more than a postage stamp.

"I'd enjoy visiting your apiary too; I would visit it if I knew the way. I'll bring with me one of the handsomest booklets, that will give you some mighty good advice about buying bees and queens. There is something about selecting, breeding and building a strain of bees, too. There is lots more too, but you will find out about that when I bring the booklet.

"If you will just write a card to W. J. Forehand & Sons at Fort Deposit, Alabama, they will start me right off in the direction of your apiary. No, I hardly ever miss the way; if I do, just write the boss again.

"I want to visit the apiary of every real beekeeper this month. It doesn't make any difference if you've got one colony or five thousand. I want to see you before you place your order because I believe I can show you how to make some extra money with your bees during the coming season.

"I'd like to visit you next. Why not write the boss right away, and I'll be over just as quick as a pair of good, strong wings can take me?"

HUBAM

A Continuous Flow of Abundant White Honey

producing nectar
until your bees
stop flying.

Exceptionally
low prices on
lots for honey
purposes.

Guaranteed
against impur-
ities until safe
in your hands

Certified-Pedigreed Northern-grown



Correspond Immediately for Particulars & Quotations

MICHIGAN STATE FARM BUREAU
BOX C-2 — SEED DEPARTMENT — BOX C-2
LANSING — MICHIGAN

March Is A Good Month

---To order your Extracting Outfit.

Hives, extra hive-bodies, frames, AIRCO
Brood Foundation, wire, etc. See catalog
pages 5, 6, 7, 10, 17, 19 and 21.

---To order your Comb-Honey Outfit.

Hives, Supers, Sections, AIRCO Super
Foundation, etc. See Catalog pages 5 to
9, and pages 15 to 19.

---To Order your Beginner's Outfit.

An order placed for an outfit this month
will insure May delivery of bees. See cata-
log pages 58 to 61.

AND THEY ARE ALL
"Root Quality"

[That catalog for the asking.
We love to quote prices.
We want beeswax for cash or trade.]

M. H. HUNT & SON, LANSING, MICHIGAN
510 North Cedar St.

SEND FOR SAMPLES

Write today for free samples of

Airco Foundation and Root Sections

We want you yourself to judge Airco Foundation.

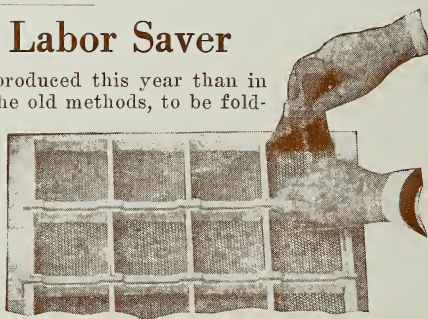
The wax in it, refined by our new process, in an immense vat, without the slightest contact with any acid, is the cleanest, strongest wax possible to have, and retains the full rich aroma of natural beeswax that the bees like. The making, done on our entirely new-plan type mills, gives the exact shape of the base of natural honeycomb, perfectly symmetrical sides of the base, with the walls braced as in natural comb. Instantly acceptable to bees.

We want you yourself to judge Root Sections.

The material in Root Sections is the highest quality No. 1 clear white-to-cream basswood lumber, free from all blemishes, carefully air-dried and cured in open sheds. Fifty years of experience is put into our buying and treatment of basswood. The workmanship is the most skillful we can hire. When you get your sample, note how accurate is the V-groove, and cut with flat bottom that prevents breakage. Polished on both sides in double surface sanding machines. The dovetailing fits clean and holds securely. It is the perfect section.

A Great Labor Saver

More comb honey is likely to be produced this year than in 1921. It is time now, if you use the old methods, to be folding the sections and fastening the foundation. But there is a way by which the foundation can be fastened so rapidly that it is not necessary to do this till the bees need the supers, thus giving the bees foundation fresh from the box. We have girls who fasten the foundation in sections at the rate of 2000 an hour by using our new Multiplex Foundation-Fastener. It's a wonder. See our Supply Catalog, page 20. Price for all-sized sections, \$2.50.



THE A. I. ROOT COMPANY, MEDINA, OHIO

Branches at 23 Leonard St., New York City; 8-10 Vine St., Philadelphia; 224 W. Huron St., Chicago; 873 Massachusetts Ave., Indianapolis, Ind.; 290 E. Sixth St., St. Paul, Minn.; 10 Commerce St., Norfolk, Va.; 120 Bay St., Savannah, Ga.; 224 Poydras St., New Orleans; The A. I. Root Co. of Texas, San Antonio; The A. I. Root Co. of Iowa, Council Bluffs; The A. I. Root Co. of California, 1824 E. 15th St., Los Angeles, and 52-54 Main St., San Francisco; The A. I. Root Co. of Canada, Ingersoll, Ontario.